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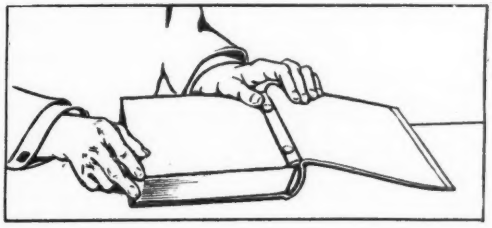

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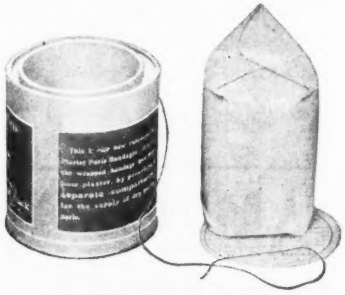

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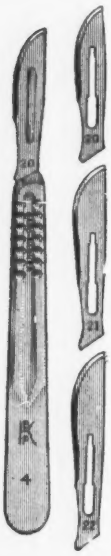

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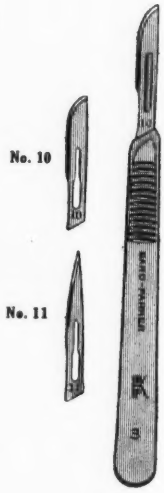

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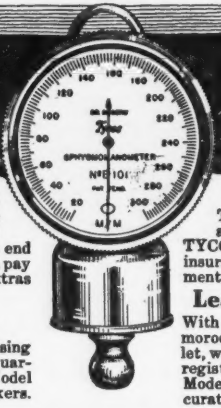

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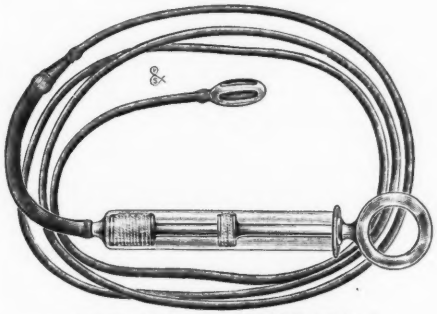

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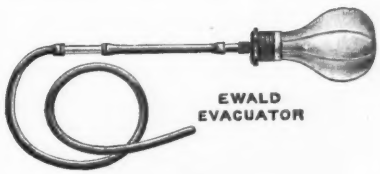

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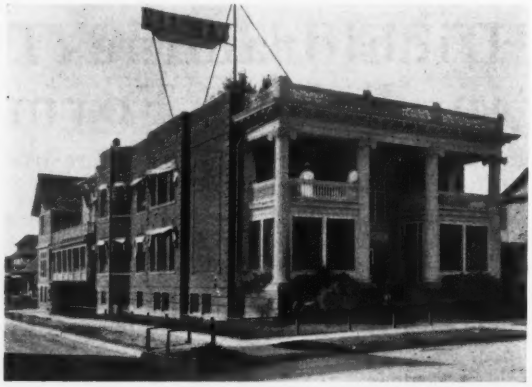

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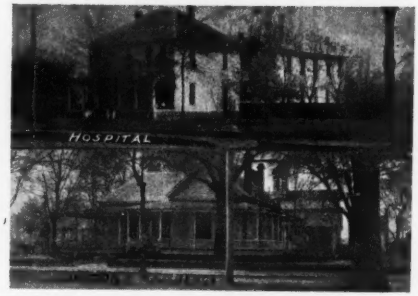

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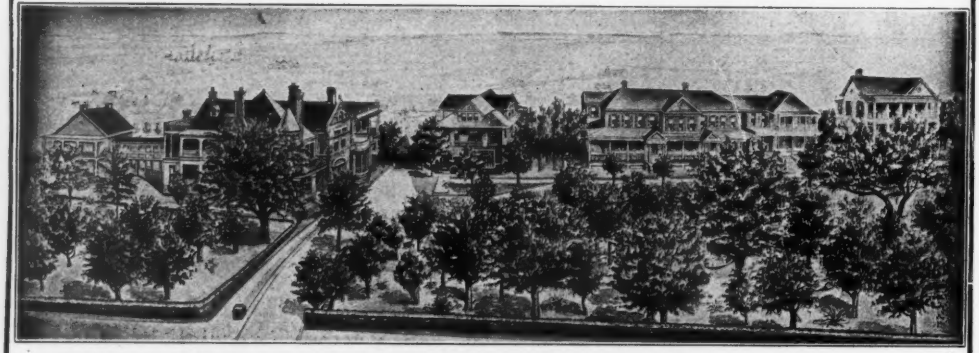

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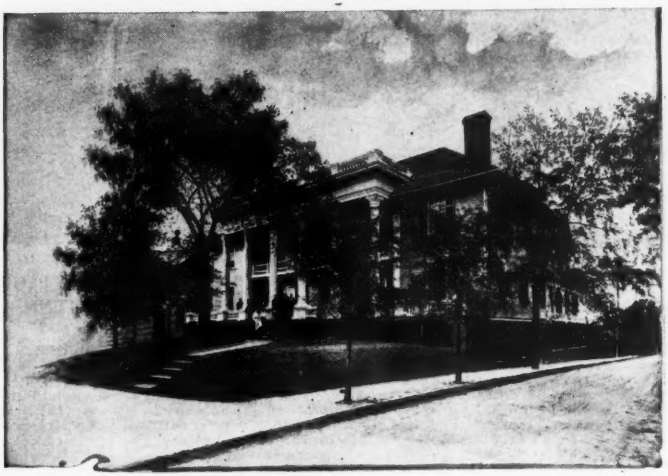

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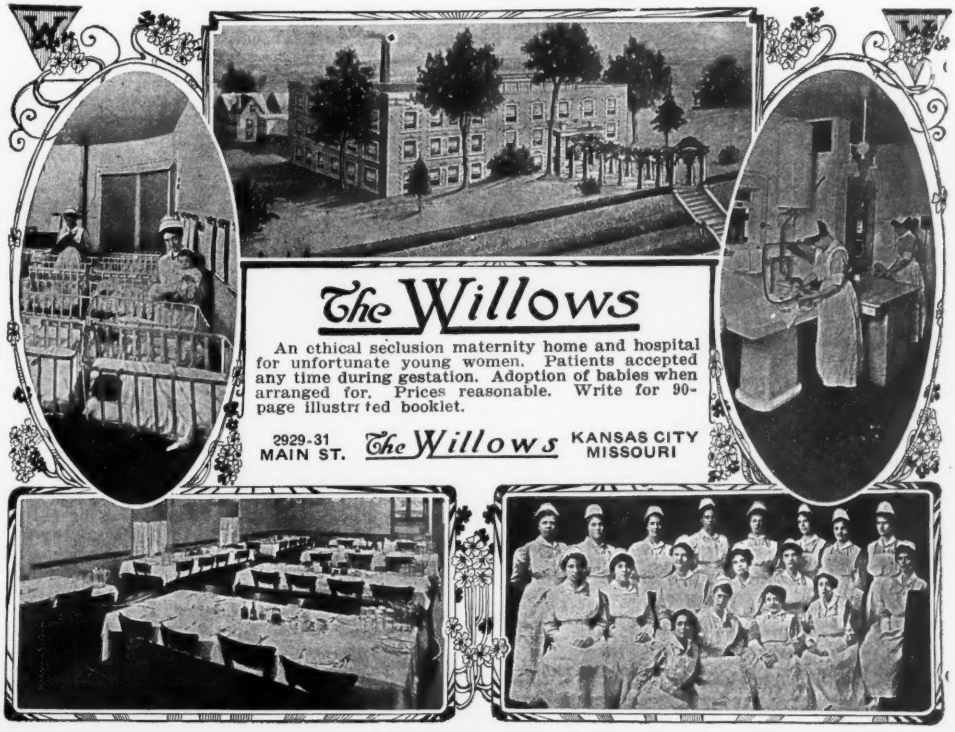

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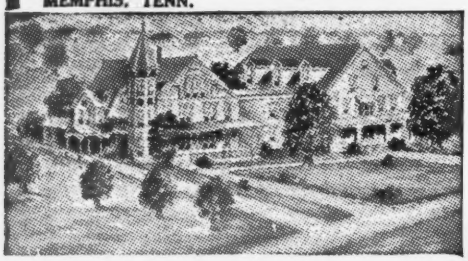

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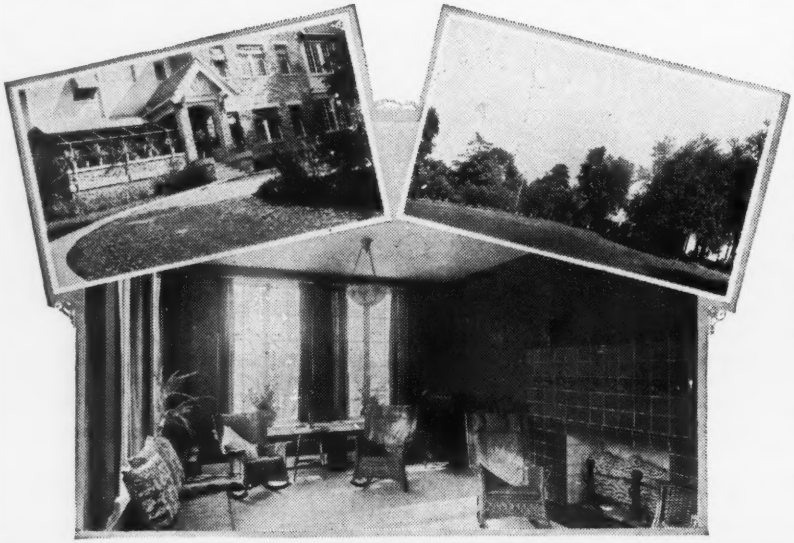

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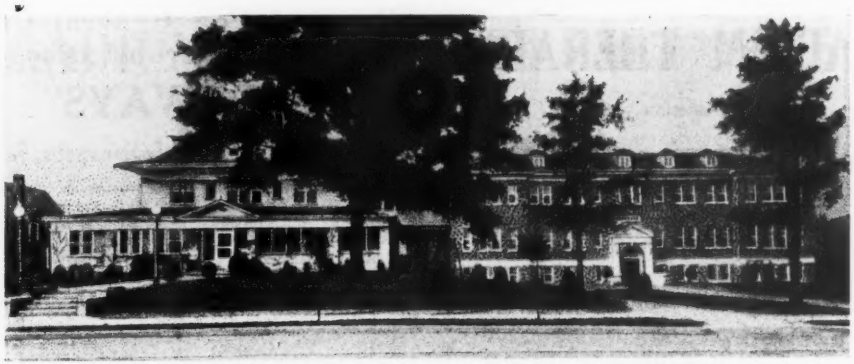

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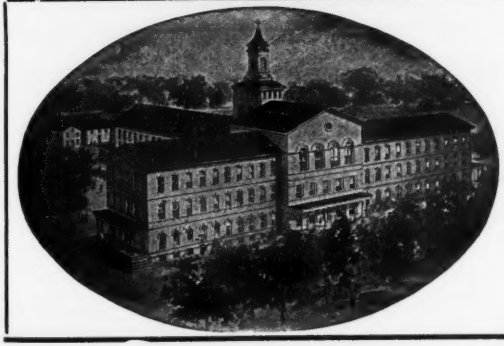

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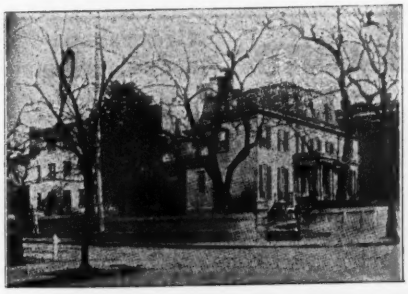

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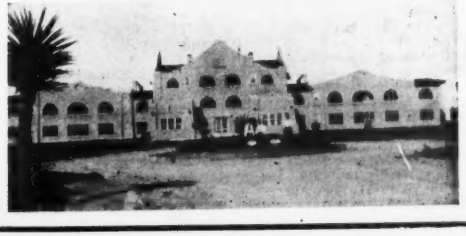

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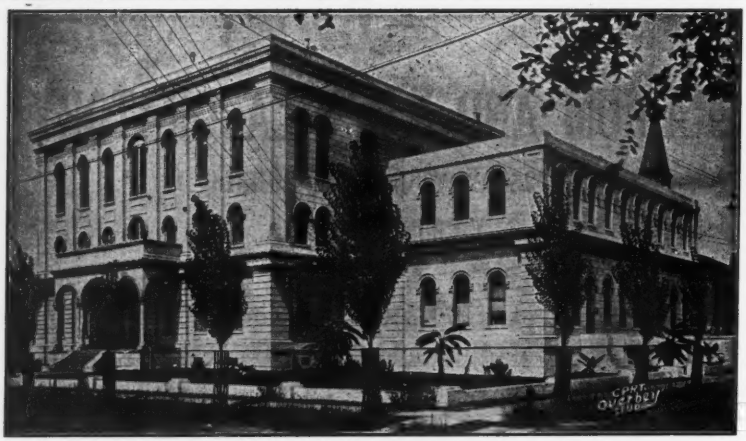

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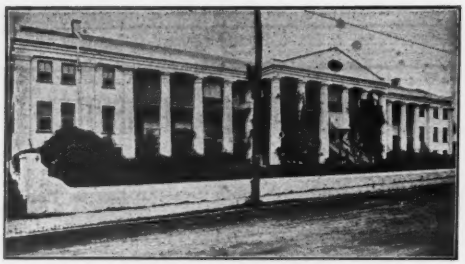

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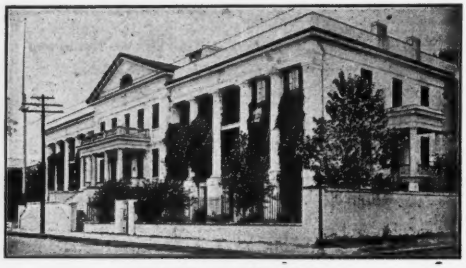

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PUBLISHED MONTHLY AT BIRMINGHAM, ALABAMA

Volume XIII MAY 1920 Number 5

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

COMPARISON OF A FEW OF THE SIMPLER TESTS OF RENAL FUNCTION WITH THE MORE ELABORATE ONES*

BY C. W. DOWDEN, M.D.,
Louisville, Ky.

Knowledge of any pathological process or phenomenon generally presupposes a knowledge of normal physiological function. Surely there is uncertainty, if not actual ignorance, concerning the part played by the various components of the kidney from the time the blood enters by way of the renal artery until urine is deposited through the ureter into the bladder. And this being true, most certainly we are and will continue to be confronted, not only by a variety or diversity of views, but by functional phenomena which are difficult or impossible to interpret and often wholly out of keeping theoretically with the existing pathology.

However, one theory which is supported by pathological or clinical evidence was presented by Ludwig, in 1844.[1] He believed that the amount of urine was increased if arterial pressure were increased, and if the rate of the flow of blood through the kidney were increased. He also held the reverse to be true. Later (1888) Senator and Munk[2] corroborated this view by observing closely the results of changing pressure and rapidity of flow brought about artificially in transfusing defibrinated blood through the kidneys. Of further interest was the fact that with the increase in urine there was an increase in nitrogen, while the quantity of sodium chlorid remained unchanged. Consistent with this view, so far as the quantity of fluid is concerned, is the diminished amount in cardiac decompensation, in obliteration of the renal artery, and in section of the spinal cord; and the increased amount where the renal nerves are divided, thus producing vasomotor paralysis, and by raising blood pressure through stimulation of the spinal cord and the splanchnics.

Ludwig, with others, believed the urine and all its constituents to be a transudation through the glomeruli under high pressure. The work of Senator and Munk would indicate at least its partial transudative character, since the quantity of any transudate depends upon the pressure and rapidity of the transuding fluid. However, this fact does not determine the amount of dissolved crystalline substances.

Our knowledge of kidney disease dates backward fifteen hundred years and there has scarcely been a year in the meantime that some new theory or new information has not been added concerning the normal or pathological function of the kidney.

Aetius,[3] between 300 and 400 A.D., associated dropsy with hardened kidney. Avicenna,[4] in 1000, added to this the knowledge that in a certain number of cases the urine was watery and increased in quantity. Then Morgagni,[5] in the latter half of the eighteenth century, described clinically and anatomically cases of granular contracted kidney associated with dropsy. Still further information was added by Cotugno,[6] in 1770, who

*Read in Section on Medicine, Southern Medical Association, Thirteenth Annual Meeting, Asheville, N. C., Nov. 10-13, 1919.

demonstrated for the first time the occurrence of serum albumin in the urine of dropsical patients. A little later Wells[7] demonstrated blood and albumin in the urine of scarlet fever patients, and early in the last century examination of the urine had been fairly well elaborated.

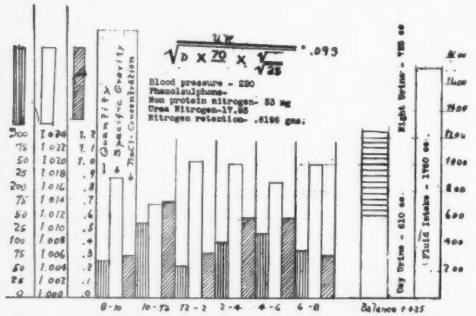
With these preliminary facts established, Bright,[8] in 1827, added more information to the storehouse of knowledge as to the cause of dropsy (which was looked upon as the disease entity) than had hitherto existed; and in 1831 he gave to medicine his classical description of chronic renal disease which has probably not been improved upon to the present day so far as observation is concerned. In his three divisions we easily recognize the types of today, although there has been a wide difference of opinion as to their relationship.

Christison[9] added the knowledge that the disease tended to suppress the solids in the urine and emphasized the impregnation of the body fluids with urea. A little later Rayer,[10] an Englishman, concluded that the chief characteristics were albumin in the urine, which contained less salt and urea than the normal. In 1841, Henle,[11] the anatomist, was the first to furnish a comprehensive description of the histology, and many of his ideas are considered correct even today. He gave the first careful description of tube casts, which he believed were composed of fibrinous exudate depending upon cirrhosis of the kidney,—in the modern sense of tissue formation.

From this period, which marks a new era in the development of our knowledge, interest centered chiefly around the glomeruli and tubules as to which was concerned most in the production of symptoms. Bowman's great work appeared about that time and, dealing as it did with the finer structures of the kidney, was naturally followed by renewed interest.

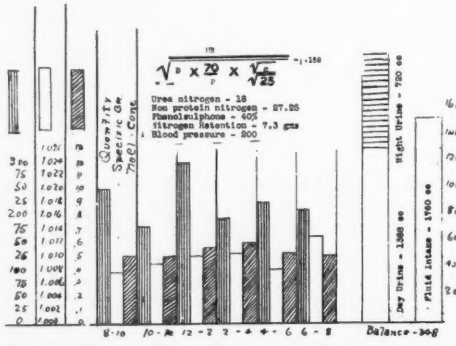
Toynbee[12] first described thickening of the arteries and interstitial cellular proliferation, while Johnson[13] devoted particular attention to fatty infiltration of the tubular epithelium. He further recognized the amyloid and fatty kidney.

Another turning point in renal disease, as well as in the whole history of pathology, came in 1852 when Virchow[14] published his celebrated article on "Parenchymatous Inflammation," which laid the corner-stone for all future ideas on the subject, although differing from our own impressions. He believed nephritis was a degenerative process resulting from excessive imbibition of exuded fluid which he regarded as exaggerated nutritive material, although an expression of diminished strength. He also divided the dis-


Blood pressure - 220
Phenolsulphone -
Non protein nitrogen- 55 mg
Urea Nitrogen-17.85
Nitrogen retention- .0198 gms.
Quantity + Specific Gravity + NaCl- Concentration
Night Urine - 730 cc
Day Urine - 610 cc
Fluid intake - 1760 cc
Balance +625

Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Note the normal variation in specific gravity, and the tendency to nocturnal polyuria. After the Mosenthal nephritic test meal there was adequate output of nitrogen and salt, and the fluid was within normal limits. The blood pressure ranged from 220 to 250, and the present test was made four months after a cerebral hemorrhage. The diagnosis in this case was evidently arterior sclercsis, and owing to the increased pressure the kidney function has not been disturbed. Interstitial nephritis would produce quite a different picture.


Urea nitrogen - 18
Non protein nitrogen - 27.25
Phenolsulphone - 40%
Nitrogen Retention - 7.3 gms
Blood pressure - 200
Quantity + Specific Gravity + NaCl - Cont.
Night Urine - 1380 cc
Day Urine - 380 cc
Fluid intake - 1760 cc
Balance -348

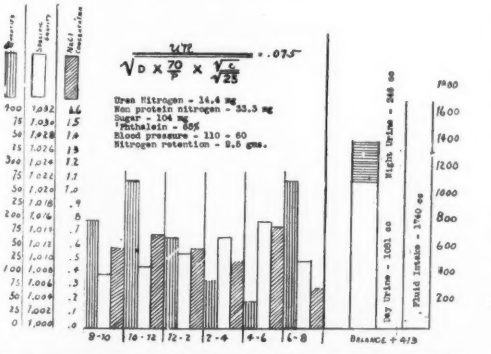
Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Note the fixation of specific gravity with the sodium chloride concentration closely corresponding. There is a minus fluid balance of 348 cc, and nocturnal polyuria which does not exceed the day quantity. Such evidence points to interstitial nephritis which compares with the more elaborate results obtained by an estimation of the nitrogenous products in the blood, the constant of Ambard, nitrogen retention after a nephritic test meal.

ease into three forms quite similar to our present-day classification.

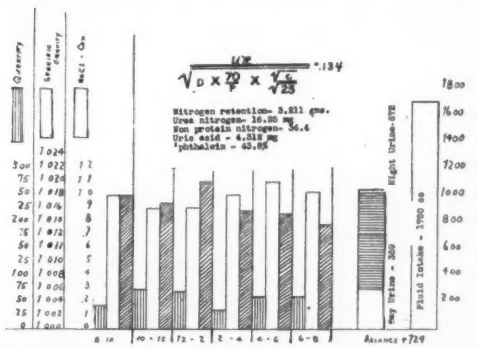
In 1859, Arnold Beer[15] first drew interstitial connective tissue change prominently into the discussion. In a short time Cohnheim's[16] observations on inflammation again attracted attention to the vascular system. Klebs[17] still later established glomerulo-nephritis as a special type, and this was regarded by Ribbert[18] as the universal incipient lesion of all forms of Bright's disease. Senator[19] held that differentiation of the two forms was impossible and proposed, as Reinhard and Rosenstein[20] had done, the term diffuse nephritis. However, he admitted a difference between interstitial nephritis and the arterio-sclerotic kidney. He held that variation in the forms of nephritis depended upon the course and duration of the disease and they in turn upon the intensity of the irritant. He denied the existence of acute interstitial nephritis without parenchymatous change. He also held that chronic nephritis may develop independently or may result from arterial change in the kidney, leading to atrophy of the glomeruli and tubules. Finally, exacerbations were not uncommon, producing variable anatomical and clinical pictures. These views have been widely adopted by clinicians.

Generally speaking, all the older literature on kidney disease dealt with renal structure, with only a hint here and there as to renal function. However, it is well to remember that the present-day tests are the outgrowth of observations made many years ago as to fluid and salt retention, low specific gravity, etc. What appeared to be (and no doubt was) a great step forward, was the experimental study of nephritis in animals. Christian, Smith and Walker[21] observed closely uranium nephritis in guinea pigs and combined function with morphology. The method seemed ideal and added much to our knowledge especially of diuretics in the treatment of Bright's disease. However, in a later paper, Christian, with Frothingham, O'Hare and Woods,[22] after a study of a number of cases of chronic nephritis, the patients dying and coming to autopsy, concluded that there was no constant relation between the anatomical lesion and the renal function in so far as the excretion of phenolsulphonephthalein, albumin and casts in the urine, presence or absence of edema, blood pressure determination, etc., were concerned. Therefore, it would seem that the present-day method of determining functional capacity, regardless of the character of the lesion, bids fair to prolong the life of the sufferer from any chronic disease and especially disease


Urea Nitrogen - 14.4 mg
Non protein nitrogen - 33.3 mg
Sugar - 104 mg
'Phthalein - 65%
Blood pressure - 110 - 60
Nitrogen retention - 9.8 gms.
Day Urine - 1001 cc
Night Urine - 240 cc
Fluid Intake - 1740 cc
Balance + 413

Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Note the variation in quantity and specific gravity and salt concentration which is normal. The quantity of night urine is normal. The coefficient of Ambard, and also the nitrogenous products in the blood are all quite normal. The blood pressure, and phenolsulphonephthalein are both within normal limits.



Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

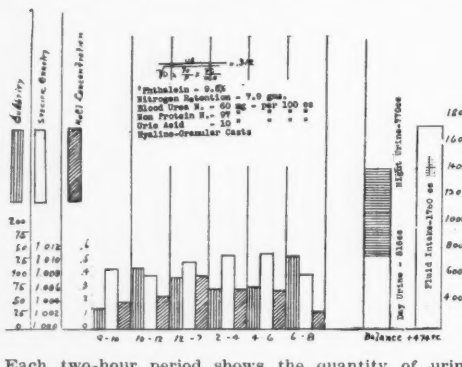
Note especially the quantity of night urine is in excess of the day urine. There is a marked tendency to fixation of the specific gravity at a rather high level which bears a rather constant relationship to sodium chloride concentration. Note furthermore the fluid retention. These evidences of disturbed function correspond favorably with the evidence obtained from the constant of Ambard, the uric acid retention in the blood, and the 'phthalein excretion. Note especially the normal blood urea nitrogen.

of the kidney, since it lends itself admirably to such investigations. Many methods of determining kidney function have been developed during the last few years.

The chemistry of the blood, especially with reference to its nitrogenous products, has been studied by many observers.[23] The phenolsulphonephthalein test of Rountree and Geraghty[24] has been widely used. The Hedinger and Schlayer test meal,[25] which was modified by Mosenthal,[26] Christian and others, was to determine renal function by estimating the intake of fluids, salt and nitrogen for a given time and quantitating each in two-hour specimens of urine for the same period. Ambard's laws[27] dealt largely with intermediary metabolism, and his plan was to determine the kidney's maximal concentrating power. He held that a comparison of the concentration of urea in the blood with its rate of excretion in the urine reduced the unknown factors to the rate of blood flow through the kidney and the functional activity of that organ. In a general way the same view was held by many older observers, chiefly Ludwig (1844) and Senator and Munk. The formula has been amplified by McLean and offers a good index to renal function.

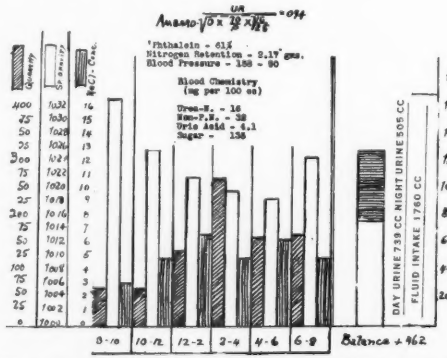
It can hardly be said that any of the foregoing tests were devised with the belief they would come into anything like general use and thus be of much benefit to the nephritic. Most of them are only applicable in hospitals, and while not difficult to perform, the fact remains that only approximately one-tenth of one per cent. of all physicians are familiar with or able to use the tests requiring blood chemical methods. If we were to depend upon one doctor out of every thousand to determine kidney function, by these methods, only a very few nephritics could be reached. If the majority of people are to be benefited by determination of the functional capacity of the kidneys, then the more elaborate tests must be simplified or made to serve as standards against which simple and easily-applied methods may be checked; they must be applicable in the home without the aid of a trained nurse; they must not require elaborate apparatus; they must not require much knowledge of chemistry; and they must detect the earliest signs of kidney disease.

It is not the purpose of this paper to decry the use of refined and accurate methods of determining renal function. During a period of four years they have been employed in three hundred cases, and we shall continue to use them where there is reason to question renal function. However, especially in connection with study of the urine according to the method of Mosenthal, we have found many interesting things. The coefficient of Ambard, the phenolsulphonephthalein excretion,



Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

An advanced case of interstitial nephritis. Note the marked tendency to fixation of specific gravity at a low level with a tendency also to fixation of quantity. The night urine exceeds the quantity of day urine. The findings are distinctly in keeping with the results of the more elaborate methods shown above.



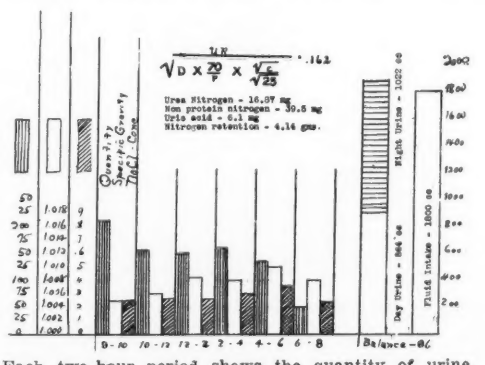
Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Note the variation in the quantity, specific gravity, and sodium chloride concentration. The blood chemistry methods were also normal with the exception of the uric acid, sugar, and blood pressure, which were increased. The diagnosis in this case was angina pectoris.

the non-protein nitrogen, urea-nitrogen, uric acid, creatinin and sugar were determined immediately after the nephritic test diet had been completed and before further food was given. There has not been a single instance in which disturbance of function was not demonstrated by one of the simple methods, such as fixation of specific gravity or of quantity, nocturnal polyuria, retention of fluids, etc., where it was indicated by one or more of the elaborate tests. I believe, furthermore, that future investigation along this line will come nearer locating and describing the pathology than will other methods. Certainly fixation of specific gravity depends upon disturbance if not actual disease of that portion of the kidney unit which has to do with elimination of the urinary constituents, particularly salt. Marked disproportion between the intake and output of fluids certainly concerns the transudative property of the glomeruli and the secretive property of the tubules if such they possess. Any pathology which will interfere with the normal concentrating power of the kidney and either allow nitrogenous products to accumulate in the blood or to decrease in the urine, which will increase the constant of Ambard, if the rate of excretion of urea depends upon the laws he has formulated, which will decrease the phenolsulphonephthalein output within two hours, will, I believe, produce a certain limitation to kidney function, depending upon its extent and degree, which can be estimated by fixation of specific gravity nocturnal polyuria, or retention of fluids. Do not these tests vary with pathology of any portion of the kidney unit?

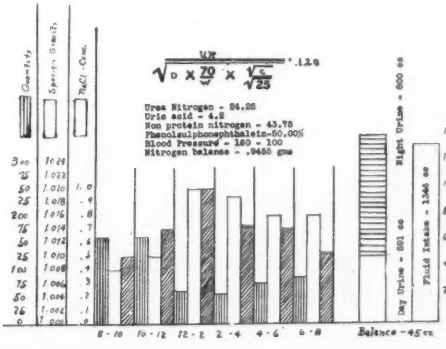
It is my opinion, which is amply confirmed by experience, that by a careful examination of each voiding of urine regardless of time and covering a period of three days or longer, during which only capacity diet is insisted upon, that in the quantity especially of the night urine and the fixation of specific gravity at a high or low level, that practically as many facts concerning pathology or function can be obtained as by the more elaborate methods. Comparing the daily output with the intake offers not only valuable diagnostic evidence, but is a most helpful index for proper treatment. I am positive that I have seen most marked improvement in chronic nephritics by limiting the intake of fluids to not more than 400 c. c. in excess of the previous day's output. Blood pressure (except the arterio-sclerotic) usually declines promptly, and when there is close agreement in intake and output there is always noticeable a marked improvement in the patient's general condition.

I am firmly convinced that the indis-


Urea Nitrogen - 16.87 gm
Non protein nitrogen - 39.5 gm
Uric acid - 6.1 gm
Nitrogen retention - 4.14 gm.
Day Urine - 844 cc
Night Urine - 1022 cc
Fluid Intake - 1600 cc
Balance -0(

Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

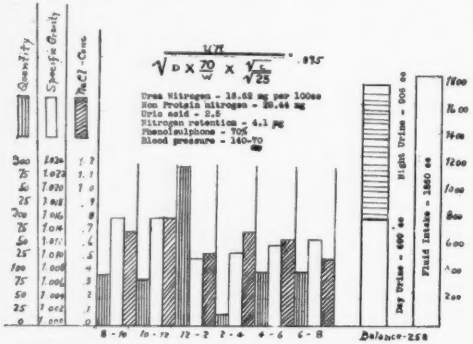
Note the marked tendency to fixation of specific gravity at a rather low level, the nocturnal polyuria which greatly exceeds the day urine, and the increase in blood pressure. The evidence of chronic interstitial nephritis is quite as positive from the simpler methods as from the more elaborate method shown above.


Urea Nitrogen - 24.28
Uric acid - 4.2
Non protein nitrogen - 43.75
Phenolsulphonephthalein-50.00%
Blood Pressure - 160 - 100
Nitrogen balance - .9458 gms
Day Urine - 881 cc
Night Urine - 800 cc
Fluid Intake - 1340 cc
Balance -45 cc

Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

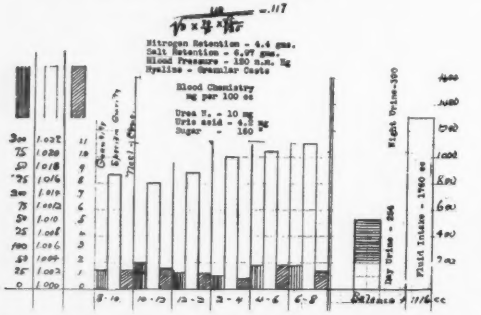
Note the normal variation in the quantity, specific gravity. NaCl concentration in the two-hour specimens. There is marked nocturnal polyuria, however, which is the only simple test to correspond with the increased constant of Ambard, the increase of nitrogenous products in the blood, and the increase in blood pressure. Note again the practically normal 'phthalein excretion.

criminate advice to nephritics to drink abundant water is wrong and probably as dangerous as to advise them to eat plenty of meat and salt. As a matter of fact, in chronic nephritics the salt output is but little or not at all disturbed. It is somewhat discouraging, after having had a patient under observation for weeks, having studied the renal capacity by the various methods and having found that 1,000 c. c. of fluid is the maximal quantity the kidney can handle, and that the salt excretion is adequate and the nitropen excretion sufficient, to have him advised by some one else without any investigation whatever to drink a gallon of water daily and stop the use of salt and meat entirely! Unfortunately such advice is still offered by several recognized diagnostic institutions, which makes matters worse, because it is accepted as authoritative.



Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Note the tendency to fixation of specific gravity with an attending fixation of sodium chloride concentration. There is marked nocturnal polyuria. The blood chemistry methods show no increase in the nitrogenous products and there was slight retention of nitrogen after the Mosenthal nephritic diet. The blood pressure was slightly increased, and the phenolsulphonephthalein quite normal. Probably early sclerotic kidneys.

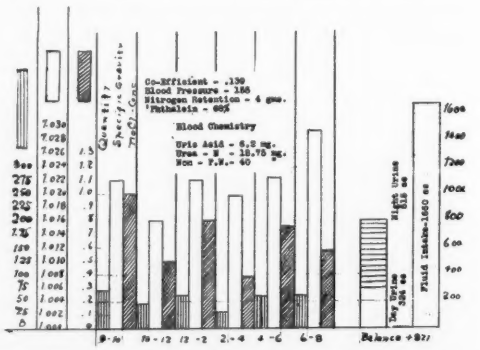


Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Test made three months after hemoplegia. Note the tendency to fixation of specific gravity at quite a high level, and the marked tendency to fixation of quantity and sodium chloride concentration at a very low figure. There was fluid retention of 1100 cc and the night urine exceeded the day urine. The evidence points chiefly to a vascular lesion There is a close relationship in these simple tests with the increase in the Ambard constant, and the blood uric acid. After the nephritic test meal there was marked salt retention and considerable nitrogen retention. Of interest is the normal blood pressure and the normal urea nitrogen in the blood which would be quite misleading. Of further interest is the hyperglucemia.

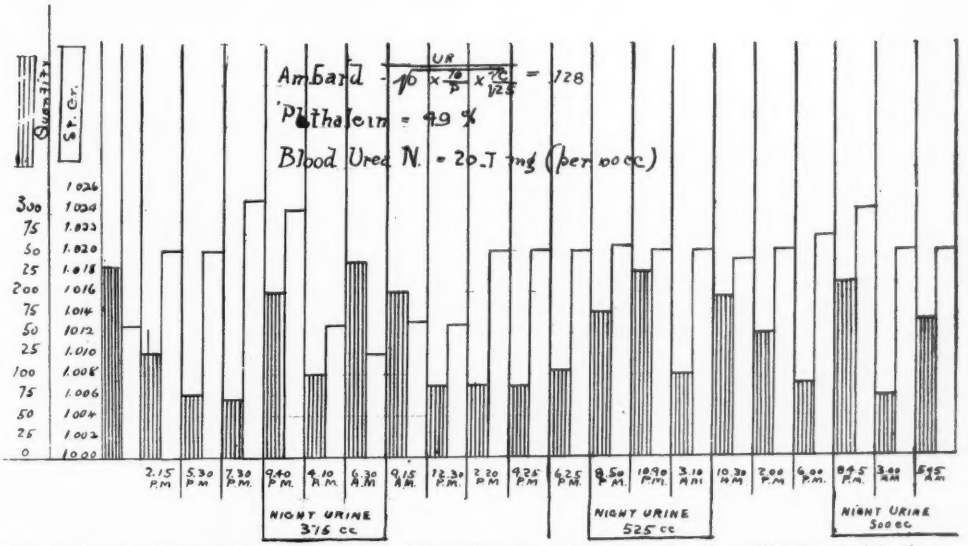
The longest of the charts* exhibited well illustrates the value of maintaining the fluid balance. At the time it was started, thoracentesis, which had been necessary in connection with general anasarca, had been practiced on three different occasions. The treatment was based upon the fluid output from day to day. The intake was always kept within the demonstrated capacity of the kidney. No drugs whatever were used when the fluid balance was satisfactory, but when this was destroyed digitalis was cautiously administered. Results were thus obtained which were

*It was impossible to reproduce this chart in the JOURNAL owing to its length (twenty-five feet).

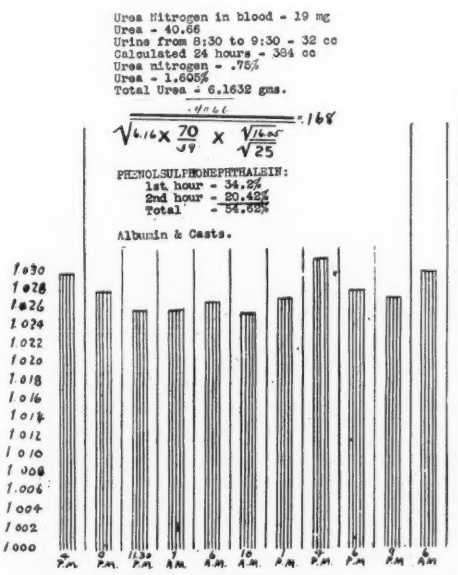


Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

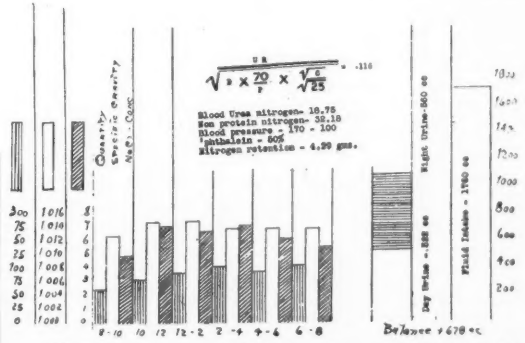
Note the marked fluid retention and the increase in the night urine. With the exception of the 6-8 specimen there is decided tendency toward fixation of specific gravity. Compared with these significant facts is the increased coefficient of Ambard and the increase in blood uric acid. There was slight nitrogen retention after a nephritic test diet. The phenolsulphonephthalein output was normal. Evidently a diffuse nephritis involving both the tubules and the glomeruli.



Showing the quantity and specific gravity of each voiding from three days duration without regard to time or food. Note the marked tendency to fixation of specific gravity at a high level. No special training and no special equipment was needed for this determination. It is quite in keeping with the increased constant of Ambard and slightly diminished phenolsulphonep hthalein output, and the blood urea nitrogen. All point to glomerular pathology.


Urea Nitrogen in blood = 19 mg
Urea = 40.66
Urine from 8:30 to 9:30 = 32 cc
Calculated 24 hours = 384 cc
Urea nitrogen = .75%
Urea = 1.605%
Total Urea = 6.1632 gms.
PHENOLSULPHONEPHTHALEIN:
1st hour = 34.2%
2nd hour = 20.42%
Total = 54.62%
Albumin & Casts.

Showing the marked tendency to fixation of specific gravity in various specimens of urine that were collected without regard to time or food. This corresponds to the increased constant of Ambard and to the slight increase in urea nitrogen in the blood. The total 'phthalein output is well within normal limits.



Each two-hour period shows the quantity of urine voided, the specific gravity, and the sodium chloride concentration. To the right the total output of urine is shown, with the quantity of night urine indicated at the top.

Note the marked tendency to fixation of quantity, specific gravity, and sodium chloride concentration. The night urine exceeds the day urine, and there was fluid retention of 678 cc. The evidence compares quite favorably with the results obtained by the more elaborate methods. The diagnosis was a vascular type of nephritis associated with organic heart disease.

The columns in the legends referring to 2-hour quantity of flow, with specific gravity and salt concentration, were obtained in connection with the Mosenthal nephritic test diet, which contained 1760 cc of fluid, 8.5 gms. of salt and 13.4 gms. of nitrogen, unless otherwise stated. In each instance the quantities were approximated for 4 days before the test was done.

not secured from its continuous use. The nitrogen balance was determined occasionally and the patient who was highly intelligent was able to keep within his capacity by a few minutes' daily study of "Locke's Food Values." This method of treatment was continued for eighteen months, during which time the patient had no hydrothorax, the blood pressure was reduced to normal, the cardiac muscle retained its integrity, the heart was greatly reduced in size, kidney function was increased, and from a helpless invalid for over two years the patient improved to such an extent that he could go to his office each day for several hours and join his clubmates frequently for a game of bridge. However, he unfortunately fell a victim to influenza-pneumonia during the past winter and, like many stronger individuals, succumbed within four days.

Certainly these simple procedures are within the reach of every physician. Their intelligent application, I am convinced, will be the means of prolonging life in many instances and preventing serious kidney damage in others.

Finally, let it be repeated, that I do not desire in the least to decry the use of recognized methods of determining renal function. However, I do wish to insist that these elaborate tests are also of inestimable value as accurate and scientific procedures by which more simple and easily-applied methods may be checked, thus bringing them within the reach of thousands of nephritics who can not secure the advantage of their direct application.

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NOTE: References 1 to 20 inclusive, are quoted from Horst Oertel's book on "The Anatomic Histological Process of Bright's Disease," Philadelphia: W. B. Saunders Co., 1910.

DISCUSSION

Dr. H. A. Christian, Boston, Mass.—This is the kind of work, it seems to me, that is very much worth while. Those of us who work in the hospital, with elaborate facilities, fail to justify our existence if we do not eventually succeed in reducing that elaborateness to terms of simplicity. A test is not really worth while until it teaches us practically how to get along without the test.

This paper has shown in a very admirable way that a great deal of information can be obtained by renal tests in terms of great simplicity. In a sense you gentlemen that do general practice are responsible for the complexity of methods we often use in the hospital for diagnosis. How is that? Because you do not do

just what this long chart represents (referring to the chart), and that long chart represents, for the most part, what the patient can do. In other words, if you send a patient to a hospital with the fluid intake and urine output on a chart like this, or the figures in pencil in crude form, because it is not necessary to put it in the form of a presentable chart, you will present to the consultant for consideration facts of extreme value in sizing up the condition.

What we usually get today is one or two laboratory reports drawn up on a sheet, very elaborate, containing a great deal of information you have not made much use of, and it is not of much use to anybody. Why? Is it because it contains information that you do not know how to use, or does it contain information that is not of much use? It is largely the latter. The average sheet may show the amount of salt and albumin in great detail, the amount of indican, and a dozen other things that are perfectly useless. In other words, it is information that is not worth while because you do not know what the patient is taking in the way of food. If you know what the patient is eating, it is worth while to know in exact terms what he is putting out. If you know what a patient's intake in the way of fluids is, it is of extreme value to know the specific gravity of the urine. If you do not know how much fluid the patient is taking, the specific gravity is not of much value. The specific gravity varies, and the amount of urine varies with the intake of fluid. But these simple forms of tests, such as specific gravity and measurement of amount in two-hour portions during the twenty-four hours, or in the single voided specimens, and comparing the night amount with the day amount, are of extreme value, and, as the essayist has said, give us just as much information as the more elaborate tests. Why the more elaborate test? The more elaborate tests have to be used because you want to get information in a relatively short time, and to do that you use all the methods that are possible for checking up what the kidney is doing. The much more elaborate methods are of value in that sense. When you make observations for a considerable time, very simple methods will give you just as much information, and if I had my preference as to the order, I would rather have the intake and output chart data over a long time than any other information furnished about the patient.

Another point I want to emphasize is that every practitioner in the past might have contributed a great deal more than he has to our information about kidney disease by frequently repeated measurements or continued observations for a long time. I think the average practitioner does not make the best of his opportunity to observe the cases with these simple methods. What the reader has emphasized is very important, and I am heartily in accord with what he says, that simple methods are worth while, and the more complex methods have their field, but the complex methods are not really accomplishing what they were intended to do until we can get along without them.

Dr. Dowden (closing)—I desire to thank Dr. Christian for the way he has received this paper. He being a pioneer in this field, I feel much gratified to have him say what he did, and I hope above all that this will offer a stimulus for further investigation along this line.

ACUTE ASCITES*

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New Orleans, La.

The condition which I wish to discuss is that of more or less recent accumulation of fluid free in the abdominal cavity. Lacking a more fitting term and imbued with a proper fear of coining a new term, I shall use acute ascites to mean an ascites which has had its origin within a few weeks of the time of its first observation. Of course I bear in mind the essentially chronic nature of the diseased conditions which usually cause ascites.

It is not within the scope of this paper to discuss the causes of ascites; but I shall endeavor to bring to your attention some of the rather striking observations which have impressed me in watching these cases; and to record the variations which duration shows.

Physical Signs.—The usual shape of the abdomen is globular. There is a lesser degree of sagging than is seen after the condition has lasted for several months.

The distension of the abdominal veins is much less marked. The respirations are usually of a purely costal type. The movement of the thorax during respiration is confined to the ribs above the sixth. The lower ribs (below the sixth) are as fixed as are the abdominal walls during the phases of respiration. The increase in the diameter of the abdomen is less noticeable than in the cases of longer standing. This is seen well in Case 2 (J. L.).

The recti seem to preserve their tonus longer than the thinner oblique and transversalis. In the same way that the transverse and oblique abdominal muscles yield to pressure before the rectus, so the diaphragm yields and becomes almost useless as a respiratory organ. Prolonged stretching of the abdominal muscles cause loss of

*Read in Section on Medicine, Southern Medical Association, Thirteenth Annual Meeting, Asheville, N. C., Nov. 10-13, 1919.

tonus, impaired nutrition and interference with blood supply. Atrophy occurs, which finally brings about a relaxation and a low-

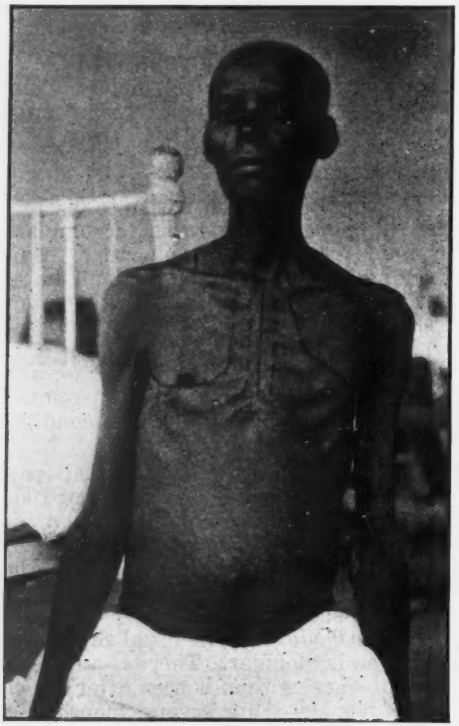

Plate 1, Case 1, W. T.

ering of intra-abdominal pressure with a partial relief from the condition.

Whatever stretching occurs of the internal and external oblique and transversalis occurs as the result of increased intra-abdominal pressure and is shared by the diaphragm. There is indeed a more pronounced stretching of this muscle because its thickness and tone are less than that of the muscles of the abdominal wall and it yields to stretching sooner. The yielding of the diaphragm is the cause of the most conspicuous of the signs of acute ascites, — namely, the signs that occur within the chest.

In all cases there is condensation and relative collapse of the lungs. This is much more marked on the left side than on the right. The line of flatness at the base was higher on the left than on the right. The strap areas (Kronig) across the shoulders were diminished on the left and motility of the chest wall was, on the left side, more pronounced in respiration over the right upper ribs than over the corresponding area on the left. Flatness at the base of the left lung is noted; and often in high pressure recent fluid accumulations in the abdomen, at the base of the right lung also. There is usually great diminution of voice and respiratory sounds at the bases over the dull areas. The apices are duller than normal and the left more so than the right. Bronchial breathing and improved voice and respiratory sound transmission are likewise increased at both apices, but to a more marked degree at the left apex.

The left border of the heart is dis-

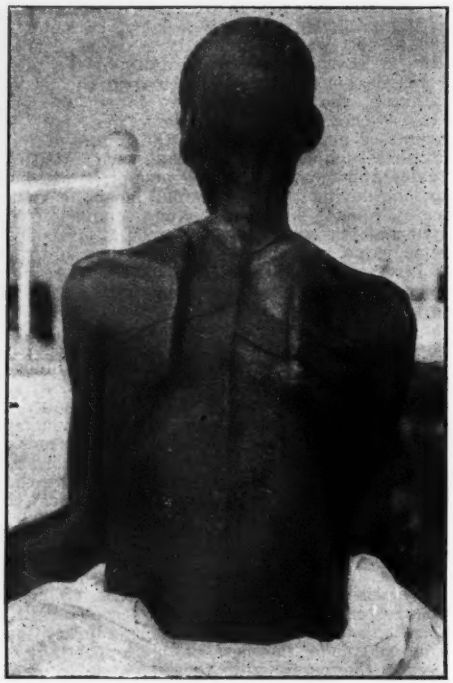

Plate 2, Case 1, W. T.

placed upward and the visible apex beat frequently seen in the fourth or even the third intercostal space. The left border of cardiac dullness lies above and outside the nipple.

The right border of the heart is likewise

usually outside its normal position, and the cardio-hepatic angle, diminished. At the base of the heart the horizontal cardiac diameter is increased, giving to the percussion tracing, a likeness to that observed in aneurysms of the arch. Dullness likewise occurs under the manubrium sterni; but does not appear at the corresponding level over the thoracic spines. This manubrial dullness is apparently caused by a crowding upward of the heart through displacement of the diaphragm.

I am convinced that the compression of the heart and its attendant signs and symptoms constitute one of the greatest menaces to the patient's health and life which we observe in these cases of abdominal distension.

The blood pressure is usually low and the heart sounds are feeble. Tapping of the abdomen frequently shows a secondary rise of blood pressure after an initial fall. The effusion into the one or both pleurae is the result of stasis in the lung. Mucous rales are heard over both lungs. These signs in the lungs I have interpreted as an indication of cardiac compression,

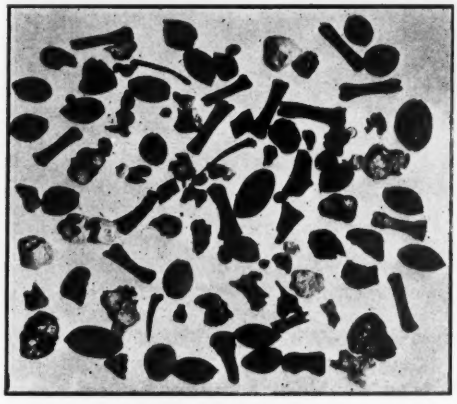

Plate 3, Case 1, W. T.
This photograph shows the various pieces of solid material removed at autopsy from the sacculations in the ileum. There are numerous faceted calculi as well as the miscellaneous masses which had been swallowed before his admission to the hospital.

and as having the same significance as the small, low-pressure pulse in the arteries of the general circulation. Auricular compression is more easily caused by upward displacement of the diaphragm because of the relative thinness and compressibility of the auricular as compared with the ventricular walls.

The following cases I have selected as

Plate 4, Case 2, J. L.

illustrative of the changes I have endeavored to describe:

Case 1 (Plates 1, 2 and 3).—W. T. was admitted to Charity Hospital August 13, 1919, in an extremely emaciated condition and gave a history of abdominal swelling first noticed two months before admission. The abdomen was not markedly distended, but yielded 8,000 c. c. of straw-colored fluid on tapping. Simultaneous tapping of the pleurae gave about 500 c. c. of fluid of reddish tinge from each side.

The level of flatness posteriorly is shown in Plate 2. The position of this line became normal after tapping. In forty-eight hours after tapping, the level was again restored to its original position. After this there was a subsidence of the ascites and at the time of his death, September 24, 1919, autopsy showed only 250 c. c. of free fluid.

The pleurae at autopsy showed 500 c. c. in the

left and 200 c. c. in the right cavity. No evidences of pleurisy were noted.

The kidneys showed marked chronic diffuse nephritis with acute changes superimposed.

The following is the report of Dr. D'Aunoy, Assistant Pathologist of Charity Hospital, on the very interesting findings in the intestinal tract:

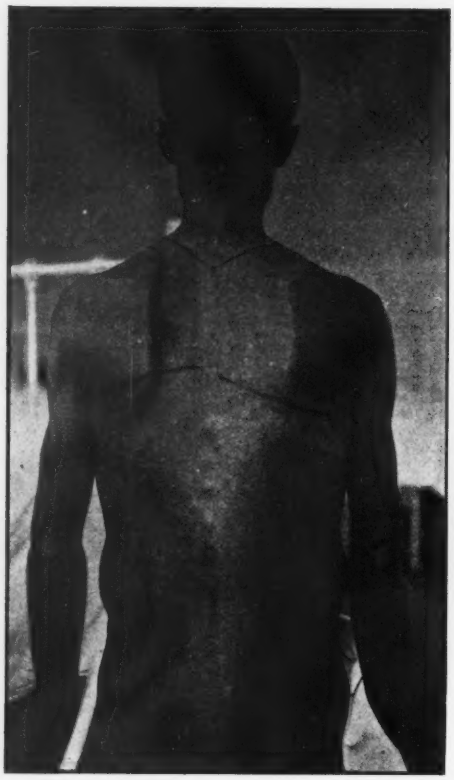

Plate 5, Case 2, J. L.

"The ileum shows 4 saculations, the largest diameters of which are 4 cm., 8 cm., and 5 cm., respectively. The first of these saculations is at a point 13 cm. above the ileocaecal valve. The distance between the first and second is 12 cm.; between the second and third, 18 cm.; between the third and fourth, 2 cm. The bowel at the point of these saculations is markedly hypertrophied, the mucous membrane being thickened, ulcerated and eroded at points as deep as the muscularis. Within these saculations are found numerous foreign bodies, amongst which particularly are peach seeds, lemon seeds, grape seeds, plum seeds, pecan shells, fish bones and frog bones. No other portion of the gastro-intestinal tract presents changes." (See Plate 3.)

Plate 3 (Case 1) shows a photograph of the contents of these sacculations.

This case is, of course, complicated by pleuritic effusion on both sides and by itself is not entirely typical for that reason. However, the physical examination before and after tapping and the fluoroscope showed a very marked upward displacement of the diaphragm, which is partly masked by the pleural effusion.

Case 2 (Plates 4 and 5).—J. L., colored, was admitted to Charity Hospital August 29, 1919, with a distended abdomen of 90 cm. in circumference, which he said had lasted several months. There was marked bulging in the flanks and the flatness at the bases of both lungs was on the left as high as the fifth thoracic spine; and on the right to the level of the sixth. The shoulder strap area was diminished on the left.

Tapping yielded 12,000 c. c. of amber-colored fluid, after which the apex of the heart, the left heart border and the lower lung borders returned to their normal position. The fluid reaccumulated rapidly and the patient left the hospital.

The increased dullness under the manubrium sternum was quite prominent in this case and disappeared after tapping.

Plate 6, Case 3, H. N.

I have reported this case in this series because although of rather longer duration, the signs are quite typical of those of the more recent cases.

Case 3 (Plates 6 and 7).—H. N. was a white man, age 48, who was admitted to the Charity Hospital August 28, 1919. He gave a history

of a swelling of the abdomen of only six weeks' duration. The abdominal distension was enormous and embarrassment of the heart was considered an indication for immediate abdominal puncture. Previous to puncture the flatness at the left base extended upward to the fourth dorsal spine.

Tapping of abdomen yielded two foot-tubfuls of milky fluid of reddish tinge and permitted palpation of the abdomen in which was a large mass resembling in contour, rigidity and position an enlarged spleen.

The blood count showed no evidence of leukemia or primary anemia.

In an exploratory abdominal section Dr. M. J. Gelpi, of the Hospital staff, revealed a mass in the abdomen which proved to be a malignant neoplasm of the mesentery. A portion excised showed it to be an adeno carcinoma. The patient died. No autopsy was permitted.

This case of very acute accumulation of chylous fluid in the abdomen shows in a very typical way the points I wish to note. Upward drift of the left half of the diaphragm was so extreme that I put a needle at the point on the skin marked "X" (Plate 7) in the sixth intercostal space and drew out the same chylous fluid as obtained from the abdomen. This was done during the abdominal tapping. Plate 6 shows the outline of the heart as it appeared on physical and in fluoroscopic examinations.

Fluid in the pleurae is not infrequent and naturally intensifies the pictures of condensation of the lung. Fluid in the pleurae changes position more readily on changing the posture of the patient than does the level of flatness in the chest from fluid below the diaphragm. Grocco's triangle of paravertebral dullness was not seen in our series of cases of abdominal effusion.

The pressure of the fluid in the cases of acute ascites was not recorded. This is a matter of regret. However, it is my impression that there is higher degree of pressure than we see in the more chronic cases. This would be expected if we remember the gradual stretching and loss of tone with actual atrophy of the muscle tissue which we see in the cases as they go from week to week and month to month.

Edema of the lower extremities is somewhat more frequent than in the cases of longer standing. This is due largely to pressure on the iliacs and tends to subside as the intra-abdominal pressure diminishes and the abdominal muscles yield to pressure.

Time and gravity work to bring about relief from over-crowding. The muscles of the abdominal wall relax through atrophy and stretching. Intra-abdominal tension is lessened and the diaphragm sinks as the case becomes more chronic. The heart is thus relieved in a measure and improves in function.

Our greatest care must be to give the heart relief from over-crowding, and an examination of the heart for signs of distress will often decide us to do a tapping where, judging by the size of the abdomen alone, we should be inclined to wait.

In the more recent case of ascites a relatively small fluid accumulation will bring about more marked changes in the thorax than a much larger accumulation in an older case. It is to call attention to these changes that this paper is presented.

Plate 7, Case 3, H. N.

I am indebted to many of the staff of Charity Hospital working in the service for courtesies in the use of material and for active aid in the collection of data for this publication.

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DISCUSSION

Dr. Frank A. Jones, Memphis, Tenn.—I like the title of Dr. Guthrie's paper, "Acute Ascites." Certainly, there are cases of acute fulminating accumulation of fluid in all the serous cavities,

thoracic and abdominal. I noticed Dr. Guthrie confined himself purely to the physical side of this accumulation of fluid without reference to the etiology or causative effects in the production of the ascites. These fluids have not been adjusted. As you know, there is a considerable difference of opinion among pathologists as to the nature or make-up of these fluids either in the pleural sac or abdominal cavity. The fluids are an interesting study to all of us. We see them, and we have not yet found out what constitutes a transudate and an exudate. In the rapid accumulation of fluid there are two agencies at work, namely, inflammatory changes acting on cellular tissue in the production of the hydremia, and in addition to that passive congestion and passive engorgement. If it is from a cardiac lesion, a failing of the heart, there is a passive congestion added to the direct cellular toxin in the production of the hydremia. Hydremia is a good term to use synonymously with the accumulation of fluid added to what we call edema. If we find an accumulation of fluid rapidly going on in the abdomen in the absence of a cardiac lesion, in the absence of any visible hepatic lesion, cancerous, gumma, syphilitic tumors of the liver; if it comes on without much disturbance in the heart; if on cardiac examination or examination of the liver you do not find much hepatic disturbance in the history or etiology, and the accumulation of fluid is rapid, if exploration is resorted to, you will find the great majority of these cases are tuberculous. I know that there has been a tendency to draw a refined line between transudates by chemical examination and otherwise, but in all these cases of fluid in either cavity, pleural, pericardial, abdominal, or elsewhere in the majority of cases, if there is a careful study made of them, you will find that there has been a preceding inflammatory condition. I have not yet brought myself to the conclusion in cardiac disease that the ascites and enlarged liver and hydrothorax are due to passive congestion in any sense. I think passive congestion is a minor consideration. In this triad of conditions, the direct cellular toxemia, irritation of the cell, and in these general dropsies of the closed cavities, we can coin the word "poly-visceo-secrositis."

Dr. Guthrie (closing).—So far as the etiology is concerned, I wish to emphasize especially the mechanical effect of the change of position of the diaphragm on the heart and the compression of the auricles. The frequent occurrence of fluid in the pleurae I have interpreted largely as the result of a mechanical interference with the heart. If the auricles are not filled, necessarily the ventricles will not be properly loaded and the heart will be disturbed by the changed condition. The nutrition of the heart muscle will also be impaired. A study of the heart is the key to the handling of these cases.

It is much the same problem we had to meet in the evacuation hospital during the Meuse-Argonne engagement in the cases of thoracic gunshot wounds. It was my privilege to watch the cases of penetrating wounds of the thorax in an evacuation hospital near the front. I observed them very carefully from day to day and noted the effect of pressure on the heart. Nearly all of the penetrating wounds of the thorax were accompanied by hemorrhage into the pleura. There was not a complete filling of the pleura in the sense that we medical men see it in the inflammatory conditions of the pleura. When hemorrhage occurs immediately following trauma the pressure in the pleura and in the arterial circulation are balanced. The hemorrhage ceases as soon as this balance is established, the blood acting as a plug. This frequently causes a moderate lateral displacement of the heart. Later on, in the presence of infection, the intrathoracic pressure is further raised, and the heart is displaced considerably and compressed by these fluid accumulations. Here the compression comes first from increase of pressure in the abdomen. Several factors serve to disturb the heart, namely, (1) mechanical pressure from below acting upon the relatively thin-walled auricles; (2) increased resistance due to pressure on the abdominal vessels producing increased burden on the heart; (3) deficient diastolic pressure resulting in impairment of nutrition of the heart musculature; and (4) lateral pressure from fluid accumulations in one or both pleurae from fluid in the pericardium, or a combination of these factors.

The key to management of these cases of gunshot wounds of the thorax accompanied by hemorrhage into the pleura is the same as in fluid accumulations under the diaphragm. The embarrassment of the heart is the point we have to bear constantly in mind. Relief must come through relieving the heart. I have coined another word, namely, *cardiac decompression*, for the operation necessary in these cases, where the heart is, through compression, being disturbed in its function. And here again, when we do abdominal tapping alone or with simultaneous pleural paracentesis for a case which shows this clinical picture, our therapy is directed chiefly toward relief of the heart—*cardiac decompression.*

SOME OBSERVATIONS ON THE SIPPY TREATMENT OF PEPTIC ULCER*

By Julius Friedenwald, M.D.,
Professor of Gastro-Enterology,
and
Theodore H. Morrison, M.D.,
Associate in Gastro-Enterology, University of Maryland School of Medicine and College of Physicians and Surgeons,
Baltimore, Md.

Since Cruveilhier first advised an exclusive milk diet in the treatment of ulcer of the stomach, and Brinton first pointed out clearly the advantages of the rest

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treatment in this affection, much interest has been manifested by the medical profession in this disease. Many variations in its treatment have been instituted, depending very much on the individual views regarding its etiology. Rosenow's recent work has materially altered our views regarding the etiology of ulcer.

According to this investigator the cause of the disease is in all probability a hematogenous infection with special strains of streptococci absorbed from some focus of infection.

On this account the view is now generally maintained that previous to instituting treatment all sources of focal infection should as far as possible be removed. This infection may be dental, tonsillar, sinus, gall-bladder, appendical, prostatic or otherwise.

Aside from removing all focal infections prophylactically, much can be done by means of a carefully selected diet in preventing the onset of ulcer of the stomach. As soon as the first symptoms appear, the patient should be placed upon an exclusive milk diet. The temperature of the food should be regulated, so that it be given not too hot or too cold.

Anemia frequently accompanies this disease and must be combated. Hyperchlorhydria, which apparently bears some etiological relation to it, must be overcome. There can be no question but that healing is apparently prevented in some instances by the action of the acid gastric juice. This fact has been demonstrated by Sippy in his method of treating ulcers, in that by instituting a neutralization of the gastric juice by the continued administration of alkalies, the healing of peptic ulcer, in many instances, is established. Notwithstanding the fact that Hardt[1] and Dragstedt[2] have demonstrated that when peptic ulcers were produced by streptococci according to Rosenow's method without the presence of hyperacidity, that delayed healing could be maintained in spite of the absence of the gastric juice; yet clinically hyperchlorhydria is usually observed in ulcer, as we have demonstrated by means of the Rehfuss method of fractional analysis.[3]

Again, if one takes occasion to withdraw the contents of the stomach when the pain is present, one almost always finds in uncomplicated cases of gastric ulcer an excess of free hydrochloric acid. If no free hydrochloric acid is observed one can not help but be suspicious of some complication or other disease.

The method of treating peptic ulcer as evolved by Sippy,[4] according to our observations in a large number of cases, has yielded the most gratifying results.

Inasmuch as it is generally admitted that a peptic ulcer heals if its surface is not continuously exposed to the digestive action of the gastric juice, Sippy's treatment consists in protecting the ulcer from the acid corrosion until it is healed. He accomplishes this by maintaining a neutralization of the free hydrochloric acid from early in the morning until late at night; usually from 7 a. m. until 10:30 p. m., or during the entire period when food or gastric secretion is in the stomach. If an excessive secretion is present at night, this is removed by aspiration until the secretion has disappeared.

The neutralization is effected by frequent feedings and the administration of alkalies, given freely and at frequent intervals. Nourishment is given from the very first onset of the treatment; the preliminary starvation and administration of nutrient enemata common to other forms of medical treatment are of little value, according to Sippy. The patient remains in bed for three or four weeks. Three ounces of a mixture of equal parts of milk and cream are given every hour from 7 a. m. to 7 p. m. After two or three days soft eggs and well-cooked cereals are gradually added until in ten days the patient receives 3 ounces of milk and cream mixture every hour, three or four boiled eggs and 9 to 12 ounces of a cereal each day. Cream soups of various kinds, vegetable purees, and other soft foods may be substituted now and then as desired. One egg is given at a time and 3 ounces of a cereal at a single feeding, the cereal being measured after it is prepared. The cereal and eggs are given alternately and taken at the same time as the 3-ounce mixture of milk and cream.

The total bulk of each feeding should not be over 6 ounces. After a longer or shorter period, according to the condition of the patient, a large variety of soft and palatable foods may be used, such as jel-

lies, marmalades, custards, cream, etc.

The basis of the diet, however, should be milk and cream, eggs, cereals, vegetable purees and bread and butter. Alkalies are administered from the very beginning of the treatment, between the feedings, to neutralize the acid secretion; powders consisting of heavy calcined magnesia 10 grains with sodium bicarbonate 10 grains being alternated with powders of bismuth subcarbonate 10 grains, and sodium bicarbonate 30 grains. It is also advisable to give the powders every half hour after the last night feeding for a number of doses. According to Sippy, if an adequate quantity of alkali is utilized on aspirating the stomach, no free hydrochloric acid will be found at any time during the period in which it contains food. If the acidity is not promptly controlled by giving the usual amount of alkali, the dose is gradually increased by adding 10 grains of sodium bicarbonate to each powder until it is controlled.

The after-management of these patients is important; the hourly feedings and alkaline powders must be continued even after the patient is pursuing his regular occupation. If this be impossible, he may be allowed a light breakfast of from ten to twelve ounces consisting of cereal, eggs, bread and butter, or any soft food. A thermos bottle containing equal parts of cream and milk can be utilized for conveniently supplying the hourly feedings. Three or four ounces can be taken hourly until noon, when a light luncheon may be taken consisting of easily digestible meats. During the afternoon, three to four ounces of milk and cream should be taken hourly until the evening meal. The total bulk of food should not be sufficient to cause a greater increase in weight than is desired. If, for any special reason, the hourly feedings can not be maintained, the three usual meals should be substituted and the powders taken every hour for three doses after a light breakfast; one hour after luncheon a powder should be taken, two powders at the end of the second and third hours, and one at the end of the fourth hour.

At the end of from ten to twelve weeks the feedings may be increased to two-hour intervals and the powders continued midway between the feedings. About twice the amount of food should be taken at each feeding, and two powders midway between the feedings.

At the end of twenty or more weeks, the patient may partake of three meals daily and may be allowed a glass of equal parts of milk and cream midway between breakfast and luncheon and between luncheon and dinner; two powders should be given between breakfast and the milk and cream and two powders between the milk and cream and luncheon. Similarly, two powders should be taken between the afternoon feedings and two powders, one and two hours after the evening meal, and again two powders three hours after the evening meal.

Sippy advises that it is best to continue the five feedings each day with powders between as directed, beginning with the twentieth week of treatment, for a period of four to five months longer. He maintains that no possible harm can accrue even after the ulcer has healed. All danger that might arise from the continued use of the alkali can be overcome by interrupting the administration of the powders for a week at the end of each five to six weeks period.

Sippy advises the same character of treatment for peptic ulcer causing pyloric obstruction as for those not causing obstruction. In about one case in ten he maintains that the obstruction is occasioned by an anatomic narrowing due to the tissue infiltration produced by the ulcer. In these cases, the treatment differs from that of the non-obstructive type in that larger amounts of the alkaline powders are required, and that aspiration of the stomach is indicated each night, a half hour after taking the last powder. Sippy prescribes as much as 100 grains of sodium bicarbonate every hour between the feedings, and every half hour after the last feeding until 10 p. m., to overcome the free acid. Ordinarily 10 to 30 grains added to each powder is sufficient to produce a favorable result. It may be necessary to aspirate again at 12 or 1 o'clock at night, and to repeat the aspiration at 4 or 5 a. m.

Usually after a third or fourth night of this treatment there is no longer an excessive secretion after midnight.

Sippy orders a seven-hour motor meal

at the end of a week or two to determine whether the stomach has improved in its power to empty itself. He finds that in most instances of ulcer associated with pyloric obstruction, the degree of retention is greatly reduced after a week or two of treatment, and that many of these cases can be effectually cured by this plan of treatment, without surgical intervention.

Since the first publication of Sippy we have treated 452 cases according to his method. The plan of treatment has closely followed that already described; in but few instances were modifications allowed. It is needless to state that the diagnosis was carefully checked up in every instance, not only by clinical but also by x-ray methods. It is also important to state that the question of the healing of our ulcer cases was determined not only by the absence of subjective signs, but also by the continued absence of occult blood in the stools and by negative x-ray findings.

Of the 452 cases, 49 were either unable or unwilling to follow the treatment for more than a few days, and the treatment was either abandoned or some other form instituted. The remaining 403 cases may be divided into three groups.

Group 1.—The milder cases which probably would have recovered under any form of treatment. There were 183 of these cases.

Group 2. The moderately severe cases which presented symptoms extending over a long period of time, in which such symptoms as pain, hemorrhage or vomiting were prominent. These cases numbered 118.

Group 3.—The severe cases, those cases which had followed other forms of treatment unsuccessfully, either medical or surgical, or those associated with persistent and recurrent hematemesis or melena or had had severe pylorospasm or evidences of partial obstruction. Of these cases there were 102.

Group 1.—Of the 183 cases in this group 172, or 94 %, were cured, while 11, or 6 %, were not cured. In the group of 11 cases 6 were not benefited and operation had to be resorted to, while 5 presented no evidences of healing.

Group 2.—Of the 118 cases in this group 101, or 84 %, were cured, while 17, or 5 %, were not cured. Of the 11 uncured cases, 5 were operated on, while 12 continued to present symptoms, notwithstanding persistent treatment.

Group 3.—In this group of 102 cases are recorded the severe cases which had resisted the usual forms of treatment either medical or surgical, in which there was present persistent or recurring hematemesis or melena or severe pain associated with pylorospasm or evidences of partial obstruction.

Of these 102 cases 38 had been treated by medical methods previously; 15 had been operated on; 24 had recurrences and persistent vomiting of blood and intestinal hemorrhages, while 25 had severe pain associated with pylorospasm or evidences of partial obstruction.

Of the 102 cases of this group 82, or 80 %, were cured; 15, or 14 %, were not cured, and 5, or 5 %, died.

Of the severe cases the greatest difficulty arises in the treatment of those associated with evidences of obstruction. The obstruction in at least 90 % of cases, as has been shown by Sippy, is due either to pyloric spasm or acute inflammatory swelling; but in a not inconsiderable number of cases the obstruction is of the partial type as described by Baetjer and Friedenwald,[5] which can be definitely demonstrated by roentgen-ray examination.

In the early stages of this condition, according to our observation, we have active contractions with the slow elimination of the stomach contents. When we note that the contractions are good but the expulsion of contents is slower than under normal conditions, we may consider the possibility of some beginning obstruction. A second very significant sign is the fact that in the study of the plates, we frequently observe that a portion of the stomach just within the pylorus on the greater curvature in the prepyloric region shows a tendency to bulge, so that the plates present the pylorus not at the end of the stomach, as it were, but the prepyloric region extends further to the right than the pylorus, the pylorus resting on the top of the stomach and pointing to the splenic region. This bulging in early cases is very small, but as

HOUR	DAYS				
A. M.	1st to 5th	6th	7th to 8th	9th to 10th	11th to 14th
7:00	Milk and cream	Soft egg, Milk and cream	Milk and cream	Cereal, Milk and cream	Soft egg, cereal, Milk and cream
8:00	Milk and cream	Milk and cream	Milk and cream, soft egg	Milk and cream	Milk and cream
9:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
10:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
11:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
12:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
P. M.					
1:00	Milk and cream	Milk and cream	Cereal, egg, milk and cream	Cereal, egg cocoa	Egg, cocoa custard
2:00	Milk and cream	Milk and cream	Soft egg, milk and cream	Milk and cream	Milk and cream
3:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
4:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
5:00	Milk and cream	Milk or cocoa, soft egg	Cereal, milk and cream	Milk toast, egg and cocoa	Milk toast, egg and cocoa
6:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream
7:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream	Milk and cream

Milk and cream each 1½ oz.

A. M.	15th	16th	17th to 18th	19th
7:00	Egg, cereal, milk and cream	Egg, cereal, milk and cream	Soft egg, cereal, cocoa	Milk and cream
8:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
9:00	Milk and cream	Milk and cream	Milk and cream	Chicken broth
10:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
11:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
12:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
P. M.				
1:00	2 eggs, cocoa milk toast	Cream-milk, toast, egg, vanilla ice cream	Minced chicken milk, milk toast, vanilla ice cream	Minced chicken cocoa, dry toast, vanilla ice cream
2:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
3:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
4:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
5:00	Milk toast, egg, cocoa	Milk toast, egg, cocoa	Milk toast, egg, cocoa	Milk toast, egg, cocoa
6:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream
7:00	Milk and cream	Milk and cream	Milk and cream	Milk and cream

Milk and cream each 1½ oz.

A. M.	20th	21st	22nd on
7:00	2 eggs, cocoa, 1 slice dry toast, butter	2 eggs, 1 slice toast, butter	Milk and cream
8:00	Milk and cream	Milk and cream	Milk and cream
9:00	Milk and cream, egg	Milk and cream, egg	Cereal, milk and cream, egg
10:00	Milk and cream	Milk and cream	Milk and cream
11:00	Broth	Milk and cream	Milk and cream
12:00	Milk and cream	Milk and cream	Milk and cream
P. M.			
1:00	Minced chicken, 1 slice dry toast, butter, cocoa, spinach	1 broiled lamb or mutton chop, dry toast, cocoa, butter, asparagus or baked potato.	Chop or minced chicken, dry toast, strained vegetable or baked potato, cocoa, butter
2:00	Milk and cream	Milk and cream	Milk and cream
3:00	Broth	Milk and cream or milk and egg	Milk and cream
4:00	Milk and cream	Milk and cream	Milk and cream
5:00	2 eggs, cereal, milk toast, cocoa	2 eggs, cereal, milk toast, cocoa	Stewed fruit or baked apple, 2 eggs, cereal, milk toast, cocoa
6:00	Milk and cream	Milk and cream	Milk and cream
7:00	Milk and cream	Milk and cream	Milk and cream

Milk and cream each 1½ oz.

Modified Sippy diet followed in some cases of peptic ulcer:

Milk and cream equal parts 1½ oz. every hour from 7:00 a. m. to 7:00 p. m. nine to twelve days.

A. M.	P. M.	MEDICINES
7:30 9:30 11:30	1:30 3:30- 5:30 7:30- 9:30	Heavy calcined magnesia ..... gr. x Sodium bicarbonate ..... gr. x
8:30 10:30	12:30- 2:30 4:30- 6:30 8:30-10:30	Bismuth subcarbonate ..... gr. x Sodium bicarbonate ..... gr. xx

Three to four days following.

7:00 11:00	3:00 7:00	Milk and cream ..... aa oz. iss
9:00	1:00 and 5:00	Milk and egg or cocoa
		MEDICINES
7:30 11:30	3:30 7:30	Heavy calcined magnesia ..... gr. x Soda bicarbonate ..... gr. x
9:30	1:30 5:30 9:30	Bismuth subcarbonate ..... gr. x Soda bicarbonate ..... gr. x

Four to five days following

7:00-11:00 9:00	3:00- 7:00	Milk and cream ..... aa oz. iss Oat meal, egg and cocoa
	1:00 and 5:00	Milk toast, egg and cocoa
		MEDICINES
7:30 11:30	3:30 7:30	Heavy calcined magnesia ..... gr. x Sodium bicarbonate ..... gr. x
9:30 9:30	1:30 5:30	Bismuth subcarbonate ..... gr. x Sodium bicarbonate ..... gr. x

To be followed for some weeks

7:00 11:00	3:00- 7:00	Milk and cream ..... aa oz. iss Milk and egg or cocoa
9:00	1:00- 5:00	Soft diet without acids
7:30 11:30	3:30 7:30	Heavy calcined magnesia ..... gr. x Sodium bicarbonate ..... gr. x
9:30	1:30 5:30 9:30	Bismuth subcarbonate ..... gr. x Sodium bicarbonate ..... gr. x

As required, additional sodium bicarbonate ..... gr. x to xx

the condition advances it may reach the size of a hen's egg. If the condition persists dilatation begins to take place, and after a time practically the entire fundus yields, so that a typical sack-like formation is produced and the entire bismuth rests in the bottom of the fundus. In this state, the examination will present a retention of contents of from ten to twenty hours.

The results of the treatment in the three groups of cases is exceedingly gratifying, there being 94 % of cures in the mild cases; 85 % in the moderately severe cases, and 80 % in the severe cases; an average of 86 % of cures in all cases.

When one compares these results with those of other forms of treatment there appears to be a marked advantage in favor of the Sippy cure. In a former study of the results of treatment of ulcer cases made by us,[6] we pointed out that but 72 % of cases were cured by the Leube treatment, 66 % by the Lenhartz, and but 50 % when treated as ambulatory cases. While we fully realize that statistical reports in

ulcer cases are of but minor importance, inasmuch as it is quite impossible in such series of cases to compare the result of treatment of cases of equal intensity, yet they indicate in a general way the overwhelming advantage of the Sippy treatment over all other forms of medical cure.

While immediate results are of some importance as indicating the advantage of any form of treatment, of far greater value are the final results, those observed after a certain number of years.

Of the 403 cases treated, 94 could be followed for a period of three years or longer. Of these 68 (72 %) remained permanently well, while 26, or 28 %. had relapses. The results are quite as favorable as might be expected when one considers the many conditions favoring relapses such as indiscretions in diet, presence of focal infections, infectious diseases, etc., which are often impossible to control when the patient no longer remains under medical supervision.

Before instituting treatment of peptic ulcer by this method, the greatest care should be exercised to arrive at a correct diagnosis; not only must the clinical history and laboratory findings be taken into account, but the condition should be confirmed by x-ray examination. It has been our habit not only to have the x-ray examination made before instituting treatment, but to take repeated plates at varying intervals so as to note when the cure is complete. Frequent examinations of the stools for occult blood when the patient is under treatment will also be of material help in this regard. It is most interesting to note how quickly a patient affected with this condition will be relieved of all symptoms almost as soon as the treatment has been inaugurated; and this sign itself is of great importance in the diagnosis. Whenever the symptoms are not promptly relieved after treatment is undertaken we must consider the possibility of complications or the presence of some other affection. The possibility of carcinoma must always be borne in mind when the symptoms are not relieved by treatment; the persistence of occult blood in the stools, and the gastric and roentgen ray findings will frequently point to the correct diagnosis.

Following the plan of Sippy, the amount of food retained seven hours after an ordinary meal gives us a fairly accurate idea of the degree of obstruction and whenever there is the slightest tendency in this direction lavage should be practiced. It is remarkable how obstructive conditions due to pylorospasm or acute inflammatory swellings or how partial obstructions yield to this method of treatment. We have not been able, however, to convince ourselves, notwithstanding Sippy's conclusions, that any method of treatment other than surgical can be of permanent help in cases of pyloric obstruction produced by marked organic disease. According to Sippy, and our own observations agree with his, in but 10 % of all cases of obstruction is this condition due to organic disease, while in 90 % the obstruction is probably due to inflammatory swelling or pylorospasm.

In conclusion, it is important to add a few remarks regarding the after-treatment of ulcer, and this applies equally to whatever form of treatment has been undertaken. Relapses, which are common following medical treatment, are frequently due to indiscretions in diet following the cure, when the patient is no longer under the direct observation of the physician. On this account the diet of the patient should be carefully regulated, acids and indigestible foods should be prohibited and alkalies administered for a considerable length of time following the cure.

From our observations of the treatment of ulcer of the stomach and duodenum by means of the Sippy method, we feel justified in concluding that this plan far surpasses all other forms of medical treatment, and that in properly selected cases cures may be effected by this method, when other forms of treatment have proven of no avail.

The following diet list (see pages 322-323) presents our method of feeding during the Sippy cure. Either sodium bicarbonate with magnesium-calcined or sodium bicarbonate with bismuth subcarbonate are given alternately on the half hour from 7:30 a. m. to 10:30 p. m.

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DISCUSSION

Dr. Stewart R. Roberts, Atlanta, Ga.—We have had presented to us in the Army a series of 452 cases of ulcer with 86 per cent. cures. If Dr. Friedenwald would permit me to exhibit those same cases to a great many men here, they would disagree with me most forcibly as to the diagnosis of many of them. There can be no question of that fact. Therefore, the question arises, when is a gastric ulcer a gastric ulcer? That is one of the most fundamental questions in modern medicine.

We have two schools: one school led by Sippy and Dr. Friedenwald, which is a medical school; another school led by the Mayo Clinic, which simply puts out medical treatment as pure gush and follows surgical methods entirely. I mention these two extremes because I believe the pendulum in the long run will swing somewhere about the center.

Oscar Richardson in 8,000 autopsies at the Massachusetts General Hospital found gastritis in only one case, and that case was due to a streptococcus infiltration and infection of the gastric wall. In all the Irishmen of Boston who died drunk at the Massachusetts General Hospital, he had not found at autopsy a single case of gastritis. I find among my own surgical friends they have found only one case at operation, on opening the stomach, of multiple erosions of the gastric mucosa. Eusterman, at the Mayo Clinic, studied a series of cases in which Carman, the x-ray expert at that Clinic, missed the diagnosis and found with every careful x-ray interpretations 22 per cent. were wrong. That necessarily makes us think. If Carman be wrong, what about Dr. Jones, of Talking Rock, Ark., and his interpretation of his cases. This is expert ray interpretation vs. inexperienced interpretation.

I have a friend who made a diagnosis of duodenal ulcer in a patient; he sent the patient to another doctor who made a diagnosis of duodenal ulcer and told him it could be cured by the Sippy method. The man grew constantly worse. He was operated upon a week later on account of his great suffering and no duodenal ulcer was found. There was no gastric ulcer. The duodenum was normal, and he had one small gallstone.

I have myself made recently two diagnoses of gastric ulcer with the aid of some of the best laboratory workers and one of the best x-ray men I know, and both of these diagnoses were palpably wrong. One had 173 gall-stones and the other had adhesions between the gall-bladder and duodenum that made a diverticulum of the duodenum. With all the x-ray findings, with all the clinical symptoms, and with all the laboratory aid a diagnosis of duodenal ulcer was made. It is, therefore, very pertinent to ask the question, when is a gastric ulcer a gastric ulcer?

Following the Sippy treatment as carried out in Chicago, there is a vast trail of patients said to be cured of duodenal and gastric ulcer, and yet they take the "Mayo Special" to Rochester and are operated upon by the method of Balfour of cautery destruction and posterior gastro-jejunostomy.

Some other questions arise. Probably more than 50 per cent. of all gastric carcinomata have as a basis gastric ulcer. Is it safe to send out these patients as cured by medical treatment, and when are they cured? I myself am doubtful sometimes as to whether or not a patient has a gastric ulcer, as I am as to whether he is cured. Dr. Friedenwald has given us 86 per cent. of cures, which is a remarkable percentage in any condition in modern medicine. We must confess, therefore, that probably the weakest point in surgery is the unsettled condition of some of these patients after treatment; and the weakest point in internal medicine at the present time is the exact truth about gastro-enterological conditions in a patient. I myself have very little confidence in a microscopic test for blood in the feces. The mucosa of thirty feet is generous with red blood corpuscles. I am a seeker after truth for the sake of the patient, and I try to make an exact diagnosis in each case and find out what kind of treatment ought to be pursued I have treated some of these patients without any symptom of ulcer with gastric neuroses by the Sippy method and they improved. If you put a healthy man to bed and give him rest, and let him read good books, he will get better, particularly if he be run down in health and tired out. I confess I am on the scientific fence; I am seeking after evidence for the doctor and for real benefit to the patient.

Dr. E. Bates Block, Atlanta, Ga.—I come into relation with this subject on account of its being closely allied with the gastric neuroses.

I want to call attention to some experimental work done in the production of these gastric ulcers. If you take a cat and grind up the mucous membrane of the stomach (this work has been done by an Englishman at Guy's Hospital), make an emulsion of it, inject that into guinea pigs, and then take the serum of the guinea pig and inject it into a series of cats, you will get a superficial ulceration of the mucous membrane of the stomach. The necrosis may be so small that it requires a magnifying glass to see it; it is not visible to the naked eye. What happens afterwards depends entirely upon how you feed this cat. If you feed the cat with acidulated food, with hydrochloric acid, you will see an ulcer eating its way into the submucosa and going down finally into the muscularis, and usually cellular infiltration taking place about the ulcer, so you have a funnel-shaped ulcer with infiltration around it. This goes on down to the peritoneal layer eventually, and if you keep up acid food this cat may suffer from a perforation. Now, then, if you diet the cat differently, after you produce superficial necrosis by this substance which you inject, an anaphylactic phenomenon apparently, and do not do anything in

regard to the cat except feed him normally, he will usually sooner or later get well. If you feed these cats upon alkalinized food, they will certainly get well. Under the microscope you see the various microscopic changes that take place, of different degrees of penetration and infiltration of these ulcers in the gastric wall. You can well control this by the diet which you give the animal.

Now, then, we have got to look at these gastric ulcers, not as permanent, but as things that come and go. A patient may have something we do not know anything about which predisposes him to ulceration of the stomach or duodenum, and when he has this anaphylactic reaction, and is in a condition to be sensitized to certain substances, he will have an ulcer as people have ulcers in the mouth. These ulcers heal of themselves. If you touch them with nitrate of silver, they will heal quicker, and the patient is all right for a few weeks, a few months, or years; yet these patients come back to you, sooner or later, with a recurrence of the ulcerative stomatitis. Exactly the same thing happens in the stomach. The patient may have an ulcer, the ulcer gets well, and within a few weeks, a few months, or a few years the ulceration comes back, depending upon the general deportment of that patient, and I fully believe that the manner of diet, the amount of rest and exercise has a great deal of influence upon the condition of the general bodily health.

I want to agree with Dr. Roberts in saying it is not always easy to differentiate gall-stones from duodenal ulcer or gastric ulcer. I myself made a diagnosis once of gastric ulcer on account of symptoms of pain coming on whenever the stomach was empty. It was relieved by taking alkalinized food. One could relieve the pain daily by giving a teaspoonful of bicarbonate of soda in a glass of water. But this patient had a sudden crisis; I thought a perforation. The surgeon operated and removed a tablespoonful of stones about the size of green peas. It was gallstones and not ulcer. I was much surprised, and yet that mistake is often made. You can not always make a correct diagnosis in these cases, but as a rule the symptoms are very clear.

I think the Sippy treatment is excellent, and it is the best thing so far as alkalinization is concerned, but we find a great many people who have anaphylaxis for milk, or who can not take milk, because it will curdle in large lumps, and they do not tolerate it very well.

Dr. Friedenwald (*closing*).—The difficulties encountered in the diagnosis of peptic ulcer are well recognized, though I do believe that with care the diagnosis can be correctly made in a fair proportion of cases. The fact that ulcers are frequently not confirmed by operation, however, does not always indicate that they do not exist. There is a large group of so-called mucous ulcers which are not indurated that can only be recognized by opening the stomach itself. In two instances in our experience patients were operated upon for ulcer in whom this condition was not revealed. They were subsequently operated upon after having had large hemorrhages and at the second operation the diagnosis of ulcer was confirmed. Ulcerations of this character are not to be considered as surgical, but purely medical, and are best treated by the Sippy method.

We still maintain from our experience, extending over a number of years, that the therapeutic test, that is, relief from symptoms as soon as the patient has been placed upon treatment in patients affected with symptoms of ulcer, is of some value in diagnosis, and when these are not promptly relieved under these conditions, we must bear in mind the possibility of an incorrect diagnosis. The 86 per cent. of cures refers merely to the immediate results of treatment; the end results present but 72 per cent. of cures. The transition of gastric ulcer into carcinoma occurs, according to our experience, in less than 23 per cent. of cases. This has now been confirmed by a number of clinicians, though the surgeons give higher percentages.

In conclusion I wish to draw attention to the fact that the etiology of ulcerations of the stomach and duodenum is as yet far from settled and that even surgery does not afford permanent cure in all instances of this disease. While we recognize the importance of surgical intervention whenever such a procedure is indicated, we believe that there are many instances in which ulcerations are amenable to medical treatment, and according to our experience the most satisfactory results of medical treatment may be obtained by means of the "Sippy Cure."

THE PROGNOSIS OF GENERAL PARALYSIS OF THE INSANE

By Egbert W. Fell, M.D.,
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The responsibility of a physician treating a case of paresis does not end with the making of a diagnosis and the giving of an unfavorable prognosis. The family is entitled to know as much of the course of the disease as possible in order to safeguard their own, as well as the patient's interests. They should be informed that he is suffering from a chronic, dementing disease, of which the consensus of opinion is that it is incurable. Special stress should be laid on the fact that it is from the first a dementing process. From the time the diagnosis is made until his death he should have a guardian for his person, and no matter how apparently good his

mental condition, important matters, especially financial, should not be entrusted to him. Providing his wife is sufficiently intelligent and co-operative to make use of the information, she should be informed as to the etiology of the disease in order that she can take steps to have her own and her children's condition looked into.

Paresis being a disease of known etiology and pathology, it is possible that some exact laboratory method of determining the location and extent of the process during life may be developed, and thus permit us to make a more accurate statement as to the prognosis. Failing in this, we are forced to depend on what experience has taught us concerning the disease in its various manifestations. The average length of life from the time the mental symptoms become noticeable is usually given as two to two and a half years. The limits are very wide, from a few weeks to ten, fifteen or more years, so that an average of the whole number is of little value from a prognostic standpoint.

The factors to be considered in giving a prognosis are, aside from existing organic conditions, the age of onset and form of the disease, the occurrence of special episodes and the serological findings.

AGE OF ONSET

An individual of any age who is infected with the spirochete may develop paresis. It occurs typically between the ages of 35 and 45, because the proper interval has then elapsed since an infection is most likely to have been acquired. Congenital lues, or an infection in infancy or early life, may result in the type known as juvenile paresis. This disease usually appears at the age of 12 or 15, is most often of the dementing type, and runs a very irregular course. If convulsions occur, as they often do, the disease is hastened. Paresis occurring in the aged is likely to run a rapid course, and to be of the depressed rather than the expansive type.

FORM OF THE DISEASE

There are four principal forms of paresis. The determination of the type is of importance prognostically because the different types run a quite different clinical course. The disease may start out as one form and eventually assume the aspect of some other form, but as a rule when once established the tendency is to run the course of that particular type.

The demented type forms over half of the cases of paresis. It is apt to occur in younger individuals. Kraepelin says that 44 % die within two years. It is especially in this type that convulsive attacks are frequent and remissions infrequent. The progress is steadily downward with often a more rapid dementing after attacks.

The depressed type occurs in older persons. Convulsions are not so frequent as in the demented type, but it runs a more rapid course, 59 % dying within the first two years. This type comprises about one-sixth of the cases of paresis.

The expansive type is more likely to run a long course, only 40 % dying within two years. It is more apt to occur in older persons. Convulsive attacks are not the rule. It is these cases that are likely to run a long fluctuating course, retaining their activity for many years and having often a number of remissions of symptoms during which they may be apparently normal mentally. This type comprises about one-fourth of the cases of paresis.

The agitated type, the least common, forming about one-twelfth of the whole number of cases of paresis, as a whole runs the most rapid course. The average duration of life in men is given by Kraepelin as sixteen months, and in women considerably less. Two-thirds die within two years, but as seizures are infrequent and some cases show a tendency to remit and run a long course, the probable duration of life is uncertain. It is this type of case especially that often becomes quickly exhausted and dies within a few weeks.

From the above it can be said that the expansive type offers the best prognosis, the demented type (especially if convulsive attacks are infrequent) the next, and the depressed and agitated types die the most quickly.

INFLUENCE OF SPECIAL EPISODES

As detailed above, seizures of various sorts occur more or less commonly in the various types of paresis. These seizures may be of the epileptiform variety, generalized convulsive attacks not followed by paralysis, which may be so frequently repeated as to constitute a status. Death

may occur at this time, or as often quite unaccountably happens, the patient may rally after his life is despaired of. Following these attacks he is likely to be more demented and their frequent occurrence has distinctly an unfavorable prognostic import. Apoplectiform attacks cause a more or less extensive paralysis, which may be permanent or may clear up quickly, leaving insignificant residua. It should be remembered also with these that the prognosis is less favorable, but that they often unexpectedly recover from the stroke with little or no permanent paralysis.

Remissions are more frequent in the expansive and agitated types, less so in the depressed, and seldom ever occur in the demented. In paresis as a whole, definite remissions occur in from 10 to 16 % of cases. Of the expansive cases, one-third remit, often repeatedly, so that the course may be stretched out over many years. Remissions may begin quite abruptly, but usually there is a gradual disappearance of the extravagant ideas and the development of some insight, but a persistence of the physical signs and spinal fluid changes. Improvement may be so nearly complete as to permit of his returning to work, and to be considered by his family and associates as recovered, but the symptoms eventually return, usually after a few months, or at most a few years, the average being about six months. Kraepelin says that remissions of more than two or three years must be regarded as exceptions, but instances have been reported of remissions lasting five or six, or even more years, one being mentioned by Kraepelin as lasting fourteen. However long the interval and complete the absence of mental symptoms, the patient's acts should be carefully supervised, for the underlying defect is still present and may lead him into grave financial or other error.

SPINAL FLUID CHANGES

The value of the spinal fluid findings in estimating the course of a paresis is not as great as might be supposed. It can be said in a general way that a high cell count and a large amount of globulin indicate a rapid process. The gold curve fails to be of help in this regard. The spinal fluid Wassermann is always positive in paresis, but the degree of positiveness is not an indication of the length of the disease. In like manner, the blood Wassermann, while of great help diagnostically, is valueless from a prognostic standpoint since paretics with negative blood do not live longer than those with a positive blood. On the other hand, a negative blood is more likely to be found in a well advanced paresis than in a recent one.

INFLUENCE OF THERAPY

Much space has, within recent years, been consumed in discussing the value of arsphenamin intravenously and intraspinally and of the various forms of mercurial treatment in paresis. The more conservative of the exponents of active treatment claim an increased frequency of remissions and improvement of focal lesions. The weight of opinion seems to be that antisyphilitic treatment does not cure paresis, nor does it cause remissions, but on the contrary, intensive treatment may cause a more rapid deterioration, an arsenical neuritis, etc. Hospital care, by regulating the life of the individual, results in a prolongation of life and he should, except during remissions, be confined in an insane hospital.

TERMINATION

The final outcome in all cases of general paralysis, unless death results from some intercurrent disease, is the same. The patient becomes progressively more demented and weaker until he is bed-ridden. He is very untidy and quite helpless. He is so nearly mindless that he is unaffected by his surroundings, but he may until the last retain residuals of his elated or depressive ideas. Death as a result of this gradual failure is the natural termination of the disease, but it may be caused abruptly by an epileptiform or apoplectiform attack, or it may be due to an infection. Pneumonia is the most frequent form of terminal infection, but pus infections in the form of large abscesses, septicemia, erysipelas, bed sores or cystitis frequently hasten the final result.

SUMMARY

In giving a prognosis in a case of paresis, the family should be informed as to the probable course of the disease, as well as to its final fatal termination.

The making of a prognosis requires a consideration of the age of onset, form of the disease, the influence of special episodes, the spinal fluid findings, and the influence of treatment.

While the duration and course may vary in the different types, the final outcome is the same in all cases.

Cincinnati Sanitarium.

ACUTE INFECTIONS OF CHILDHOOD*

By R. M. Pollitzer, M.D.,
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It might seem a physical impossibility to discuss the acute infections of childhood in a single paper, but there are certain general principles and points of contact which are exhibited by them and these can readily be considered briefly. While children have many of the diseases of adults and we find the converse equally true, yet there are certain diseases which are confined almost entirely to childhood, and some of these are rather hastily dismissed under the category of "the diseases of childhood." Most people and many physicians, too, consider these ailments as mere trifles unworthy of serious consideration. To a busy physician in general practice, possibly straight from a tedious hysterectomy, naturally a slight bronchitis and conjunctivitis, perhaps the onset of measles is not especially interesting. And yet what a difference a day may make to other children.

During the past few years the child welfare movement has undoubtedly made great strides. Society's whole attitude has changed. Most people no longer regard children as little nuisances. The average mother today is interested in feeding her child properly, even though frequently her notions are wide of the mark. Furthermore, she shuns any exposure to tuberculosis, goes far from infantile paralysis and shudders at hearing of any disease or condition with a new name, such as acidosis. But the time has not yet come when she realizes that the commonest children's diseases in reality take the greatest toll.

Again and again we find people who insist that measles and whooping-cough do not amount to anything. Nevertheless, during 1916 in the registration area of the United States there were 7,947 deaths from measles and 7,284 from whooping-cough. You may say we know all this. Yes, you do, but the man on the street who has children to be protected does not. And because of his ignorance the child mortality is unnecessarily high. Not that we can give any sure way of escape, but since the diseases can be postponed for several years, this should be our endeavor. All statistics prove that the highest mortality is before the fourth year, at least in measles and whooping-cough. There are many diseases which, while they are common in childhood, apparently differ widely as to symptoms and signs. However, there are several which because of their extreme contagiousness and their almost constant presence, may well be considered together. Measles is certainly very different from whooping-cough and yet broncho-pneumonia is the commonest cause of death in both. Scarlet fever with its punctiform erythema off-hand would not be confused with diphtheria, but both are characterized by a sore throat.

Let us take stock, as it were, of our knowledge of measles, whooping cough, scarlet and diphtheria. Notwithstanding some recent excellent work, the causative factor of measles has not been found. Until it is, we shall have to postpone the solution of many of its problems. But clinically the diagnosis is easily made before the rash. This early diagnosis is most important for the safety of others. One great field here would seem to lie in the education of the people first that measles is most contagious before the eruption and that it is a very serious disease, especially in early childhood. The most important points in the management of the case is close attention to ears, mouth and lungs. In general, measles is very badly treated by the practitioner. Aside from a cough mixture and drops for the eyes, he does nothing that the grandmother could not do. It is a reproach to medicine or the modern conception of the doctor's function that many individuals

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do not employ a physician for this malady.

Since 1906, the organism responsible for whooping-cough has been known, although the scientific world has been quite slow in accepting the Bordet-Gengou bacillus as the sole cause. Very probably we in time shall make more use of cultures in establishing the diagnosis. However, today the diagnosis is made clinically, and usually very late, which is not surprising. For until the paroxysmal stage ensues, aside from the blood count, which is often uncertain, as guides we have only the progressive nature, the frequency at night, the laryngitis and occasionally the vomiting. Of course, history of exposure or the presence of an epidemic is most important. But frequently a correct history is not obtainable. Whooping-cough is a disease of very early life. Eighty per cent of all cases are in children under five. Unfortunately there is no immunity or even partial immunity in the first year of life. The only reason that more infants do not contract it is because they are not exposed. This factor in escape is more common in the first born. From time to time we see the disease in the first month. In September, 1918, I attended a white male who was born with a cough and whooped on the ninth day. He contracted it from his mother. Although I have no figures as to its frequency in the first year, yet of the cases that occur one-half die. Furthermore, 97 % of its total mortality is among those under the fifth year. It has been shown by John Lovett Morse that pertussis is more fatal than scarlet fever. It has been well said that whooping-cough is a disease the mortality from which entitles it to more serious attention than it usually receives from physicians and parents.

In South Carolina alone in 1918, two hundred twenty-four children died from it. Because the disease at its onset is only a cough and throughout its course usually does not necessitate being in bed, there is a most excellent method of spread. The patient does not have to wait for the approach of his victim, but goes in search of him. It is the common practice to advise keeping the child in the open as much as possible, but it is uncommon to caution against going near others. I am perfectly willing to admit that the prophylaxis of this disease is difficult, but I can not agree that because of the difficulty we should not make the attempt.

Prophylaxis, to be effective, should be viewed as a matter of both public and private health. Isolation probably is out of the question until such time as all large communities can have contagious hospitals. In the meanwhile all those affected should most certainly be compelled by law to wear some conspicuous insignia of the malady.

So very much has been written in regard to the vaccines that the literature has become bewildering. And yet after reading the adverse reports and the numerous pleas the sensible course is to be guided by our own experience. However, we must sharply differentiate between the use of a vaccine as a means of prevention or of cure. It is true that at times where it is begun as a prophylactic measure we realize after the first or second dose that the disease is already present. Nevertheless, it may be used in well children before exposure or before the onset as an immunizing agent. The reports as to its efficacy are quite varying. In a few cases I have employed the vaccine in well children who have never had the disease. Subsequently, they were unintentionally exposed and did not contract it. From most reports it would seem as though artificial immunity lasts for about a year. This subject is deserving of more study.

As to treatment, I think some progress has been made. At least we have frankly abandoned many worthless drugs. All of us today rely to a great extent on fresh air free from much dust. Over and over again we are told that it is less often that a paroxysm occurs outdoors. However, the great difficulty is to make people understand that vigorous exercise and automobiling are not included in the prescription. Probably sodium bromid with antipyrin is effectual in a large measure as often as any other drug. For the past three years in most cases of pertussis I have employed the stock vaccine. Where it was commenced late, it proved worthless; and at times even early it had little if any effect. But on the whole in many cases the paroxysms were not severe and the disease was of less than usual duration. On

the whole, I believe it is worth using. Until the time comes when we are able to accomplish its defeat therapeutically we must endeavor to impress on the public the fact that pertussis is a menace. Ruhrah has well said, "There is no other disease causing the same amount of suffering and the same danger of life in which there is the same disregard for the feelings and the rights of others."

Notwithstanding the finding of a diphtheroid bacillus in the throat of scarlet patients by Mallory, in 1916, as yet we lack sufficient evidence to accept his theory. Unlike many other of the acute infections, aside from the clinical phenomena our knowledge in this disease is very incomplete. We are not even sure that it has been transmitted to monkeys. There is not a single drug that has the least effect in modifying its course.

It has a greater variability in its virulence than most diseases except influenza and infantile paralysis. We know that it is not nearly so contagious as measles and whooping-cough, notwithstanding the popular belief to the contrary. In general, close and prolonged contact is essential to its transmission. Furthermore, we in the South seldom see the severe cases that are so common in New England. Unless throughout this whole country better management has had some influence, then the virulence has decreased.

The diagnosis is never difficult in typical cases, but in the very mild or the fulminating types it is often missed. The average man is too prone to neglect the throat and history in favor of the eruption. A scarlatiniform rash by no means indicates scarlet fever. Drug rashes, toxic erythemas and the second rash of Dengue have been so labeled. It is not unusual for experts to disagree on the diagnosis in some of the atypical cases.

Scarlet fever is particularly rich in complications. Like influenza, its onset is often but the excuse for more damage. Ears, throat, nose, heart, joints and kidneys are commonly attacked. Otitis is said to occur in from 15 to 20 % of the cases. Generally it is preceded by slight symptoms and is of a severe character. Unlike the measles ear, the damage is often permanent. Nephritis ensues in about 7 % of cases. Like the causative disease, though, without any relation to it, it varies markedly in severity.

Many scarlet fever patients are neglected by their physicians in regard to frequent physical examinations. Furthermore, it is not sufficient to examine a specimen of urine, but the twenty-four-hour amount excreted and the fluid intake for the same period should be recorded.

The value of prolonged stay in bed is difficult to estimate, but I believe it is worth while. Diet in all cases should be carefully planned with a view to reducing the protein fraction, and at times the amount of water. Unless the physician is interested in pediatrics or internal medicine he is content with prescribing milk alone. This, of course, is a mistake.

Because the mortality from scarlet fever is high and in as much as the complications often result in permanent damage, it should be our constant endeavor to prevent the child from having it. Although many adults do contract it, yet it is essentially a disease of childhood. In a series of 1,000 cases at the Boston City Hospital, 78 % of the individuals were under eleven years. Furthermore, parents should not proceed on the assumption that the child is bound to have it sooner or later, for only 50 % of children become sick from it. Prophylaxis in general is fairly simple. Early diagnosis with prompt and complete isolation, which includes sterilization of all outgoing articles, is essential. Medical inspection of school children should prevent a pupil's remaining in school who has a sore throat or a headache and vomiting. All statistics tend to prove that much scarlet is spread in the class room.

Unlike scarlet fever, there is unfortunately nothing alarming in the onset of diphtheria. The average individual judges of the severity of any disease by the amount of fever or pain present. The fact that diphtheria frequently gives rise to less constitutional disturbance at least for several days than the ordinary tonsillitis is undoubtedly responsible for many deaths. When asked what medical science has accomplished for humanity, we can point with pride to what has been done in diphtheria. Our knowledge here is more complete than in any other disease. Beginning with the discovery of the organism, in 1883, the introduction of the serum in 1893, and finally the Schick intra-cutaneous test for immunity, in 1915, we have made great strides in the conquest of this once dreaded disease, which even

as late as 1889 was written of by J. Lewis Smith as "one of the most fatal and unfortunately one of the common maladies of childhood." Today we have bacteriologic aid to diagnosis, we have a specific remedy, a test for immunity, and methods of immunizing. And yet in the registration area of the United States in 1916, over 10,000 people died from it.

Barring the few malignant cases, the accidents incidental to intubation, and the rare pulmonary diphtheria, we certainly should expect to have all our patients recover, provided we are summoned in time. The fault clearly lies in two different directions. First, we have not impressed people sufficiently that in diphtheria time is a most important factor, nor have they been taught that any sore throat may be diphtheria. On our side there are still too many who persist in using insufficient dosage or rely upon the repetition of the injection. In South Carolina the State gives the antitoxin free, so there and in many other states expense to the patient should not figure in the estimation of the number of necessary units. Many physicians who give doses that are too small are luckily fortunate in their results because many cases are very mild.

We must not lose sight of the fact that prior to the introduction of antitoxin at least 40 % of people recovered by their own antitoxic powers. While the subcutaneous or intra-muscular route is good enough for the average case, where we are confronted with a very severe infection or much time has been lost, the intravenous method is imperative and vastly superior. I am convinced that it is not employed sufficiently often.

Today we are relying in many ways entirely too much upon the laboratory. While necessarily it is the supreme court in making the diagnosis, yet in most cases by our clinical methods we should know in advance. I try to classify all my throat cases as surely diphtheria, surely not, or doubtful. No man can be right always, but especially upon our medical students should we try to correct the tendency of leaving it all for the laboratory.

At times I have known the diagnosis to be missed not because the practitioner did not know diphtheria, but because the throat was not examined or because he did not have sufficient light or failed to use a tongue depressor. I consider wooden tongue depressors as one of the most important instruments that the physician can carry.

It is unnecessary to go into the differential points in diagnosis, though it is not amiss to state that Vincent's angina and syphilis have been mistaken for it.

In scarlet fever it is best to give antitoxin in all cases where diphtheria is suspected. As a rule the diagnosis of diphtheria is correct and the treatment is along correct lines. The contrast between the per cent of deaths in the pre-antitoxin days, 50 %, and only 13 % today, is sufficient proof. However, my contention is that this figure should and must be reduced almost to zero.

There are fewer unsolved problems in diphtheria than in most of the other infections. By the use of the Schick test we have learned the percentages of immune people at different ages. Furthermore, among individuals we know who has sufficient natural antitoxin to prevent the acquiring of the disease under ordinary conditions.

The prophylaxis of this disease is most important. It divides itself readily into two parts: first, defensive as isolation of the patient and destruction of all his secretions; and second, the production of an artificial immunity in the well person, either rapidly by the injection of serum, or slowly by the use of toxin-antitoxin mixtures.

Nothing can take the place of a strict quarantine. Artificial immunity induced by serum unfortunately is said to persist for but three weeks. I, therefore, rarely use it. Our knowledge of the active artificial immunity is not yet complete, though it promises much. It would be better for more physicians to use the Schick test where children have been exposed than to give immediately a prophylactic dose of antitoxin. Formerly in the large contagious hospitals all scarlet fever patients were given prophylactic doses of diphtheria antitoxin. This has been discontinued, at a saving of pain to the individual and expense to the state.

It would lead us too far afield to take up the many interesting complications of diphtheria, especially of the ear, kidneys and neuro-muscular system. Suffice it to say that our medical students can not be too strongly impressed with the fact that the danger in diphtheria does not lie in

the visible local lesion, nor is it of today, but on the contrary it is in the unseen soluble toxin which is anchoring itself to the tissues and the effect of which will be produced next week.

The carrier problem, while recognized, has by no means been solved. It is of tremendous economic importance.

I shall not attempt to include meningococcic meningitis or poliomyeloencephalitis, for while essentially serious infections of childhood, they are far less common than those already considered.

On the whole, then, we must realize that the four common contagions of childhood which I have considered cause directly or indirectly a large mortality. Diphtheria, which is curable, is not yet being properly fought. The problems of measles, whooping-cough and scarlet fever require much more work, or rather results, than so far. In the meanwhile we undoubtedly can do our best work as practitioners by promptly isolating our contagious cases and using all means to prevent their spread. Medicine has made great advances in the control and treatment of the acute infections, but we must and shall go further.

DISCUSSION

Dr. L. W. Elias, Asheville, N. C.—I would like to say in connection with this paper that if we want to have a subject treated concisely, we had better pick out professors of pediatrics, as this paper well illustrates. I do not see how so wide a subject as the one presented this afternoon could have been covered any more thoroughly and satisfactorily than Dr. Pollitzer has done it. He has left very little to be said. He has taken up the infectious diseases of children; has gone through them thoroughly, and has given us clear clinical pictures, and anything I may add will certainly be of minor importance.

One thing that I would like to mention and stress is the examination of the mouth and throat of the child. It is a subject that is constantly emphasized, but never emphasized enough. You will find good practitioners, and good internists, who, when called in to see a baby, neglect to look at the throat. They treat the child for all sorts of things that it has not, whereas a simple examination of the throat would have cleared up the condition. The point should be emphasized again and again that the baby's throat should always be examined.

Another thing: in visiting case after case, we as physicians have a haunting fear that we may carry scarlet fever and diphtheria to somebody else. Not to make us careless, but for our comfort it is well to remember that practically all of the contagious diseases are contracted directly from the patient, or much less frequently from the person who has become a carrier. But the carrier proposition is hard to get at. If we remember the small possibility of our hands becoming carriers of disease, and if we keep our hands clean, and do not let the patient cough, expectorate or sneeze on us, we have taken the most sensible precautions that we can. It seems thoroughly established that carrying contagion on our clothes is not the principle thing which we have to fear. The other points mentioned are far more important to watch.

Cases of scarlet fever at times are very septic. Here blood transfusion is valuable. Drawing blood out of the vein of a donor and injecting it into the muscles of the patient is easy of accomplishment, free of danger, and effective. This, with the Murphy drip, and like measures, should be employed in all severe cases.

Dr. Oliver W. Hill, Knoxville, Tenn.—There is one thing we have reason to be ashamed of, every one of us, namely, the prevalence of communicable diseases. These diseases are just as prevalent now as when our fathers were practicing medicine. About two years ago I attempted to get some data on this subject and in so doing I wrote to a number of cities. I found the percentage of deaths from diphtheria in Chicago was no less in 1914 than in 1904, despite the fact that they had diphtheria antitoxin and used it, due to the fact that the spread of the disease was not under better control than it was formerly. More diagnoses were doubtless made in 1914 than in 1904.

I believe that something we have to learn more about is carriers and about the communication of these diseases. Dr. Elias said: "Don't let these patients cough on you, but if you have clean clothes and change them now and then it does not hurt if they should cough all over you." I believe the thing will eventually resolve itself in a thorough knowledge of the various factors of cleanliness just as in surgery. We have known for a long time how to prevent puerperal sepsis. We know now it is considered criminal to have puerperal sepsis following a case of obstetrics. With puerperal sepsis we know somebody has been guilty of neglect; he has not washed his hands. I wish more investigation could be made of such factors. We are seeing children with whooping cough and are not as careful as we might be in caring for them.

A Member—What did you say the mortality was from diphtheria in Chicago now as compared with former years?

Dr. Hill—In Chicago it is no better today than formerly.

A Member—There must be something wrong with your statistics. I mean the mortality per thousand from diphtheria.

Dr. Hill—I meant the cases per capita of population of the city.

If an examination of the nose is made in these cases, you will run across nasal diphtheria when you least expect it.

Dr. W. A. Mulherin, Augusta, Ga.—I am very glad Dr. Pollitzer called attention to the high mortality of whooping-cough in the first year of life. This fact is not fully appreciated by the laity and is due in a measure to physicians not impressing parents with the seriousness of this disease in early life.

The importance of oral and faucial hygiene, and free drinking of water, in the treatment of infectious diseases should be especially stressed. I believe scrupulous cleanliness of mouth and throat to be the best preventive against secondary pneumonia in such cases. Take, for example, influenza. We know that the resulting or accompanying pneumonia is due to a mixed infection. Is it not highly probable that the secondary infection gains entrance to the lungs through the mouth? If the mouth and throat are kept as germ-free as possible, it does seem logical that we should expect less pneumonia. Again, take scarlet fever as another example. In this disease we know it to be rare for scarlet fever *per se* to kill. The complications of nephritis, otitis media, cervical adenitis, pericarditis or endocarditis are what give us most concern. If the mouth and throat are kept clean, the Eustachian tube will have less chance to carry infection upward to the ears. The same thing might be said about the cervical glands. As these glands drain the pharynx and nasopharynx, the less infection that exists in these localities the less likelihood there is of enlargement of these glands.

If to oral and faucial hygiene we add the free drinking of water, say a half to one glass every two hours, depending upon the age, we will help in a great measure to avoid the complications of nephritis and cardiac diseases. If it be toxins that cause these complications, then dilution and free elimination appear to be the sensible treatment. The great majority of influenza and scarlet fever patients require no other treatment, except the proper regulation of diet.

As regards the use of antitoxin in the treatment of diphtheria, I think exception should be taken to Dr. Faison's remarks, in the discussion of Dr. Sidbury's paper, when he stated that he would as soon given his little patient poison as to administer a second dose of antidiphtheritic antitoxin. Practical experience and a study of the medical literature will not bear him out in his contention. If I remember correctly, Gillette, of New York, a few years ago reviewed the literature on this point and reported thirty-odd deaths due to supposed anaphylaxis following the administration of antitoxin. In some of these cases the autopsy revealed a status lymphaticus not before suspected. In his series practically all of his cases were adolescents or adults and had previously suffered from hay fever or asthma, caused by contact with a horse.

When we consider the millions of children who have been given antitoxin once, twice, or many times, and the absence of reported deaths due to its administration, it appears that the real and alleged dangers are practically nil. I believe that the consensus of opinion today on this subject is that there should not exist the slightest hesitancy in freely giving antitoxin to a child suffering from diphtheria. A possible exception may arise in those rare cases where the child is subject to asthmatic attacks when exposed to the odors emanating from a horse. In such cases, slowly injecting a few drops at a time of the antitoxin will almost invariably meet with success.

About the dose of antitoxin, it is generally considered better to give one large single dose, as for example 20,000 units, than to give 10,000 units and repeat the dose in eight or twelve hours. The reason for this is that the antitoxin is slowly absorbed from the subcutaneous tissues and we are losing valuable time when we do not inject the total amount the child needs in the first dose. The mere fact that we have to repeat our dose should be accepted by us as an acknowledgment that our judgment in dosing the child was in error. The use of antiseptic solutions for washing hands in the sick room, in such cases, is worthy of comment. Personally, I do not use them, for they not only do not kill infection, but chap the hands and thereby form an excellent nidus for carrying infection to other patients. If investigation were instituted to determine the germicidal action of the various solutions used, I feel quite sure the result would teach us that not a few minutes, but many minutes, and perhaps a few hours, would be required to kill the germs present in such cases. The generous use of soap and water, and less antiseptic solutions appear to be the most rational mode of procedure as a precautionary measure in infectious diseases.

Dr. I. W. Faison, Charlotte, N. C.—I would not have gotten up if Dr. Mulherin had not mentioned my name in connection with the use of antitoxin. About giving antitoxin in these cases, I believe in tonsillar diphtheria 10,000 units will cure every case. I believe 20 to 30,000 units will cure a case of laryngeal diphtheria if it is going to cure it at all, best given intravenously. I think 20 to 30,000 units of antitoxin is enough to give a child two or three years old with diphtheria. Of course, some of them will die. I have had them die under 40,000 units.

With reference to scarlet fever, I agree with Dr. Pollitzer that half of them do not have it. If these patients are isolated and cared for and watched, it is the best plan of handling them.

In regard to whooping-cough, I believe in the treatment of this disease with vaccines. I believe in giving the vaccines in heroic doses, starting it with two hundred and fifty million and going from ten million to a hundred million or four billion. I have seen the vaccines do good time and again in these cases. The trouble is we do not give enough of the vaccine. After the first ten or fifteen days the patient has given it to all of the neighbors he is going to give it to, and after that time he will probably not give it to any others. I agree with Dr. Dunn, of Boston, in regard to that. At the time you make the diagnosis the patient has whooping-cough; the time for that patient's giving it to somebody else has passed. The damage has been done. The fuel is afire and it burns just the same.

Dr. Pollitzer (closing)—I believe we ought to keep in mind that where one child dies from anaphylaxis a thousand die from lack of antitoxin.

With regard to whooping-cough, I agree with Dr. Faison absolutely that we would probably have better results if we gave the vaccines in bigger doses. While I do not feel absolutely sure that vaccines will cure all cases of whooping-cough, I believe they are certainly worth trying and ought to be helpful.

TROPICAL DISEASES AND PUBLIC HEALTH

WORK OF THE PUBLIC HEALTH SERVICE IN THE CARE AND TREATMENT OF SICK AND DISABLED PERSONS DISCHARGED FROM MILITARY SERVICE*

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It may be briefly stated that, so far as the Public Health Service is concerned, those persons who are entitled to the benefits provided for veterans of the World War, comprise "discharged sick and disabled soldiers, sailors and marines, Army and Navy nurses (male and female), patients of the War Risk Insurance Bureau." Under existing legislation, these classes of individuals, with certain distinct limitations, are entitled to the benefits created by the War Risk Insurance Act. It may be noted that the legislation which has been passed by Congress for the care of such persons is very dissimilar from that legislation which was passed by Congress for the care of veterans of the Civil War. The present legislation does not contemplate a pension system such as existed for veterans of the Civil War. It was the object of Congress to outline a comprehensive program for the purpose of giving, not a small pension for life, but a larger allowance for a variable period of time, together with the necessary medical care and treatment for restoration to health; and also, where sufficient residual disability existed materially to reduce the earning capacity and constitute a vocational handicap, to furnish the means whereby such a person might receive vocational training, perhaps in some new line of endeavor, with the object of restoring his earning capacity to normal. Monetary compensation to such persons is so adjusted that with the restoration to health and the ability to return to industry, this compensation may be reduced or may cease altogether. That is to say, that the disabled individual is submitted to periodic examinations and the amount of his compensation is rated according to his physical condition. When he is ultimately able to resume his place in civil life, with a normal earning capacity, his compensation may be discontinued altogether.

To carry out this comprehensive program, Congress has enacted three basic pieces of legislation with regard to men discharged disabled from the military forces. These are, the Acts creating the War Risk Insurance Bureau and the Federal Board for Vocational Education, and Public Act 326 of the sixty-fifth Congress, authorizing the Public Health Service to provide the necessary additional hospital and sanatorium facilities for the care and treatment of these individuals. Since the original acts were passed, some modifications have taken place, and these modifications are still going on, and doubtless such modifications will continue for a long while to come. The trend of these modifications is constantly to increase the benefits of these acts and extend them to more individuals. As the legislation now exists, the War Risk Insurance Bureau is charged, among other matters, with the determination and payment of compensation, and with the duty of furnishing disabled discharged military men such reasonable governmental medical, surgical and hospital services as may be useful and reasonably necessary. The Public Health Service is charged with providing for the Director of the Bureau of War Risk Insurance, in the discharge of his functions, the necessary medical, surgical and hospital facilities. The Federal Board for Vocational Education is charged with the duty of furnishing vocational education to those individuals whose disability has so reduced their earning capacity as to require such training.

It is obvious that in order to carry this legislation into effect there must necessarily be co-operative adjustments of a very broad character between the agencies involved. Such adjustments are by no means easy to make and will require both

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time and patience. An important step has been made in these adjustments in that the medical sections of the Bureau of War Risk Insurance and of the Federal Board for Vocational Education are now under the direction of medical officers of the Public Health Service who are detailed to the respective heads of each bureau for this purpose.

It is also manifest that for the best interests of all concerned there should be very close co-operation between the agencies which have been mentioned and those agencies by which men are discharged, namely, the Army and Navy. It is evident that where disabilities are known to exist, it is to the advantage of the individual to be discharged from the military service directly to the medical care of the new agencies which are now charged with his physical well being. Co-operation of this character has likewise been the matter of serious thought and adjustment, and, it may be added, it is the policy of the Army at the present time to retain in its hospitals sick and disabled soldiers until they have received the maximum benefit from hospital care and treatment before they are discharged.

For practical purposes, matters have been arranged so that the individual discharged from the military forces can apply to any of these agencies for the necessary advice and help in securing the compensation and allowances which are permitted under the law.

Being confronted with a new problem, it is manifestly prudent for the Public Health Service to learn as rapidly as possible the magnitude of the responsibility which has been suddenly placed upon it. This, of course, has been, and is, a matter of earnest thought to all concerned. It is not only a question of the number of individuals involved, of where they are located, and from what disabilities they suffer, but also a question of legislation which is undergoing continuous changes, largely in the direction of increasing rather than decreasing the size of the problem, and likewise of the very important question of time. That is to say, when may one expect the demand to reach its peak, and when will be the most urgent need for the facilities which are to be provided?

From the information which is available from all sources, one can do no more at the present time than to make very rough estimates. These will undoubtedly require modification. The Chief Medical Advisor of the Bureau of War Risk Insurance, in a recent unpublished report, has reviewed this question at some length. Taking into consideration changes in legislation which are expected at an early date, he states that the total personnel engaged in the war with Germany who are affected by this legislation, number something like five million persons; the known demobilized, disabled individuals number over 640,000, a percentage of whom, of course, suffer from disabilities of a very minor character. He estimates that the Public Health Service will probably be required to supply, within the next two years, about 11,000 beds for the care of patients suffering from mental disease or from disease and injury to the central nervous system; about 12,500 beds for the care of patients suffering from tuberculosis; and about 7,500 beds for patients suffering from general surgical or medical disabilities. This, of course, does not take into consideration the very large number of persons who will suffer from disabilities not sufficiently grave to demand treatment in a hospital, but who will have to receive out-patient relief of one kind or another. The number of such patients will probably be from two to fourfold greater than those who require hospitalization. In addition to this, consideration has not been given to the artificial legs, arms and other prosthetic apparatus which will have to be supplied to a large number of individuals. Moreover, a very large number of these patients will require either minor or very extensive dental work, of one kind or another, as well as other special services of various kinds, demanding special facilities and a special personnel. It should also be mentioned that a great many of these patients, especially those suffering from mental disturbances or tuberculosis of the lungs, will have to be kept under observation for a long period of time, even when not hospitalized, and this and other considerations will render necessary the development of a social service system whereby many such patients can be kept under ob-

servation and followed up, even with regard to their home environment, in order that they may be restored to some industrial efficiency. In addition to all this, consideration must also be given to the fact that modern hospital conditions will require that many of these patients shall receive occupational therapy while in the hospital, looking forward to the vocational training which they may take up when they are discharged. These very rough estimates and very general statements are made only for the purpose of giving some idea of the magnitude of the problem involved in carrying out the legislation which has been framed by Congress. They are sufficient to show that the putting into effect of this legislation will involve the creation of very extensive agencies and the expenditure of large sums of money.

In order to meet the responsibility which has been placed upon the Public Health Service by this legislation, the essential necessities are: an adequate organization, both central and field; an adequate personnel, both professional and non-professional; adequate facilities of all kinds, and, of course, adequate appropriations.

It must be presumed, without discussion here, that Congress, representing the people of this country, will undertake to supply adequate appropriations to carry into effect the program which they have framed.

The development of the central organization of the Public Health Service means a very rapid and very broad expansion of that function of this Bureau which has charge of hospitals and relief. This expansion, already well begun, is proceeding as rapidly as circumstances will permit. So far as the field organization is concerned, the United States has been divided into fourteen districts, which districts correspond to the same divisions adopted by the Federal Board of Vocational Education and the Bureau of War Risk Insurance, and to a large extent to the divisions of the American Red Cross. Each of these districts has, as an executive, a medical officer as district supervisor, who maintains at some convenient point a large central office with subsidiary offices in the large centers of population and local examiners in the smaller centers and in the rural districts, supported, of course, by the various hospitals, dispensaries and other agencies which are rapidly being established in all of these districts. In this way the disabled individual discharged from the military service may rapidly come into contact with medical personnel, be promptly examined, and, when necessary, distributed to the nearest relief station with a minimum loss of time.

So far as the hospital and sanitorium facilities are concerned, Congress has passed legislation which permits the Public Health Service to acquire the use of both Army and Navy hospitals, as demobilization renders these unnecessary, and also to buy or lease other available hospitals which may be used. Up to the present time very little construction has been authorized. In addition to this, machinery is available whereby contracts may be made with existing civilian institutions for the care and treatment of War Risk beneficiaries.

Under this authority the Public Health Service is rapidly extending its hospital system, and, including its original Marine hospitals, is now operating a total of over forty hospitals of various kinds in different parts of the country. This number is being increased steadily and rather rapidly. In addition to this, contracts exist for the care of beneficiaries of the War Risk Insurance Act in a very large number of civilian hospitals throughout the country. At the present time the Public Health Service has in its own hospitals about 4,000 patients of the War Risk Insurance Bureau and in civilian hospitals almost as many. The admission rate of these patients is steadily increasing from week to week.

Comment might be made upon the use of existing civilian hospitals for the care and treatment of men discharged disabled from the military forces. Without entering into the details of any discussion, it may be said that in a great many cases there are obvious advantages in hospitalizing disabled persons as near to their homes as possible, and in practice this has, to a certain extent, in spite of disadvantages, been found both feasible and satisfactory. It will undoubtedly be nec-

essary for the Government to maintain and operate hospitals of its own for special classes of cases and to supplement, where necessary, existing civilian facilities when these are inadequate, as they are in many parts of the United States.

In the plans for the adequate hospital care and treatment of beneficiaries of the War Risk Insurance Act, such considerations have been given due weight with the idea that by using local civilian institutions the Government can not only render satisfactory service to the patient, but also may render a useful service in extending and building up local institutions where these are not adequate.

One of the most serious problems which confronts the Public Health Service is the question of personnel, particularly medical personnel. This problem is being met by the use of the regular commissioned officers of the Public Health Service and by the appointment of reserve officers, a great part of whom are officers discharged from the Army and Navy. It is met also by the employment of Acting Assistant Surgeons, either for whole or part time duty; of consultants, either on a salary or fee basis; and by local medical examiners on a fee basis. The question of nursing personnel has been very well met by arrangements with the nursing service of the American Red Cross and the formation of a nurse corps, which now numbers some 600 or more individuals.

So far as the hospital and relief facilities are concerned, it is obvious that for a time temporary arrangements must be made until Congress will authorize an adequate program of construction to meet the needs. This period of transition will undoubtedly result in the use of buildings which are not entirely satisfactory for the purposes to which they must be put, but it is hoped that buildings can be found which will guarantee to the patient adequate care and treatment in spite of the deficiencies which must necessarily exist when such buildings have not been actually constructed for hospital purposes, but have been remodeled to meet new conditions. This was the method which had in a measure to be adopted by the Army, and which proved fairly satisfactory.

It may be worth mentioning that in the buildings which have been taken over for temporary purposes are included certain base camp hospitals which, by act of Congress, were taken over and put into use in spite of protests that they were not at all suitable. The base camp hospitals, constructed by the Army during the war, were necessarily rather flimsy structures, hastily constructed, and not at all suited to post-war needs. Their location, construction and administrative arrangements render them, as a rule, highly unsuitable, and have made necessary the abandonment of some of them after a trial of a few weeks. It is regretted that these structures are not more suitable for continued hospital use. It is understood that effort was made at the time of their construction to make them less temporary in character, but the urgency of the moment prevented doing any more than was done. From the experience of the Public Health Service, such places are not suited for hospital uses under peace conditions unless a great deal of money is expended upon remodeling and reconstructing them. It may be found wise to do this in one or two instances. Some of them will undoubtedly have to be used for a time, pending the construction of better buildings, and they can be made fairly comfortable and usable with the expenditure of sufficient money.

There is one matter, however, which should receive some attention. Even before the war, the character of service rendered to patients by hospitals was undergoing a change and this was accentuated by war conditions. Medical men have in recent years been inclined to adopt a new point of view with regard to hospitals and the adequate care of patients housed in them. It used to be the idea that a hospital was a place where a man necessarily went while he was sick, and that as soon as possible he was discharged to make room for another patient and then forgotten. The modern idea is somewhat different from this. It is now felt to be the duty of the hospital not only to take care of a man while he is sick and see him safely through his convalescence, but, so far as possible, to see that he is returned to industrial life again in as fit condition as possible to meet the struggle for existence. In its broadest sense, this would

mean the existence of a great many expensive agencies, which hospitals may not always be able to supply. The idea, however, is essentially correct, and if put into practice would ultimately mean increased economy and efficiency.

Whether a system of this kind be feasible in civilian hospitals at the present time may be doubted, but certainly under the program which has been outlined by the Government in its care and treatment of disabled men discharged from military forces, it is contemplated that such a system shall be carried into full effect and the disabled individual ultimately returned to industrial life restored to health, with one hundred per cent earning capacity, provided such a thing be possible.

To carry this program into effect means the creation of a large social service and welfare organization, with visiting nurses, an adequate system of out-patient and dispensary relief, and with the necessary machinery to follow up and keep in touch with those discharged from the hospital until they are thoroughly established in civil life. In addition, it means occupational therapy and related services while in the hospital, supplemented by the necessary vocational training when the patient has received the maximum benefit which he can derive from hospital treatment.

The Public Health Service has begun part of these activities by the establishment of a co-operative scheme with the Home Service Section of the American Red Cross, which has undertaken to look after the social service and welfare work of the hospitals conducted by the Public Health Service. It has also created in its Hospital Division in Washington a Section of Reconstruction, including occupational therapy, which goes hand in hand with much of this work, and it is rapidly placing in all of its hospitals vocational aides to carry into effect its program of occupational therapy as preliminary to the vocational training which many patients will receive from the Federal Board for Vocational Education when they are discharged. This program is undoubtedly a large one and will require both time and patience, as well as work, for its successful consummation.

In conclusion, it may be stated that the Public Health Service assumes this new responsibility, not only with a full and adequate idea of the magnitude of the task and the difficulties involved, but also of the privilege which it enjoys in being associated with other agencies to carry into effect the benefits which Congress has seen fit to confer upon those who have made such sacrifices for their country. It is needless to add that the Public Health Service will, of course, do all that lies in its power successfully to meet these new duties and new responsibilities.

MALARIA CONTROL THROUGH THE APPLICATION OF ANTI-MOSQUITO MEASURES AND SOME OF THE RESULTS OBTAINED IN SOUTHEAST ARKANSAS*

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State Director, International Health Board,
Mound, La.

By the control of malaria through the application of anti-mosquito measures is understood a concentrated attack upon the insect host, both in the aquatic stage, by such measures as will prevent production as far as considered economically practicable, and by such mechanical means as will prevent imagos from gaining access to the population one desires to protect. From the demonstrations so far conducted, it would seem that the first method, that is control of production, is far better and gives more permanent results in small municipalities.

It is purposed in this paper to outline briefly the methods pursued by the International Health Board, co-operating with the State Board of Health, in controlling malaria in four small towns in southeast Arkansas, namely, Lake Village, Dermott, Monticello, and Bauxite, with special reference to proportionate reductions obtained in ratio to their respective costs. In all four units the measures employed consisted exclusively of those directed against the propagation of the responsible

*Read before Conference on Malaria (National Malaria Committee), Southern Medical Association, Thirteenth Annual Meeting, Asheville, N. C., Nov. 10-13, 1919.

mosquitoes and have differed so little in all four towns, varying only in minor details as local conditions would warrant, that it is considered necessary to outline only the general methods of attack.

ORGANIZATION OF WORKING AGENCY

As stated, control operations were conducted by the International Health Board, co-operating with the State Board of Health, the city health officers and town officials. Headquarters were established in Lake Village, Ark., the railroad facilities from which made the remaining units easily accessible. By a written agreement entered into, the officials pledged their support to the Director in charge by enacting an ordinance designed to prevent the breeding of mosquitoes, by making an appropriation toward conducting the work, and providing for its maintenance during succeeding years, and by investing the Medical Director with authority for supervising and conducting the work. The local physicians were committed to co-operate by agreeing to furnish transcripts of their office records showing the number of cases of malaria observed by them professionally during the two preceding years, and to furnish at monthly intervals during active operations, a report of the number of cases seen, and calls made during the month for which the report was intended. The Director in charge was assisted in the work from the first of April to the first of November by local sanitary inspectors, provided for by the towns' appropriations. Necessary laborers and equipment were obtained in the vicinity of each locality and were also provided for in the appropriations made by each unit of control.

EXTENT OF OPERATIONS

The extent of operations for the control of anopheles production, taking into consideration that the zone of control extended in some of the towns as far as three-quarters of a mile beyond the established town limits, covered an area of approximately 12 square miles, which included a population of nine thousand, nine hundred and eighty for the four units.

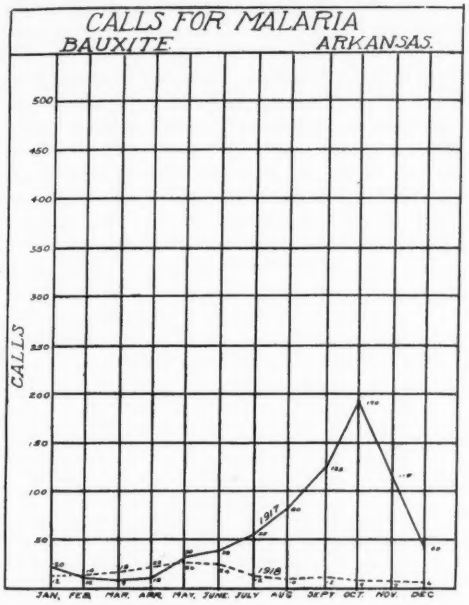
INAUGURATION OF CONTROL MEASURES

Actual control operations began in all four units April 1, 1918. At this time, a census was taken of all the inhabitants and a sanitary survey made of all the homes. In the census special effort was made to obtain an accurate history index of malaria for each unit, accepting as positive only those cases in which a history of repeated periodicity could be obtained. In the sanitary survey, conditions surrounding the homes were taken into consideration, with particular reference to the presence of artificial containers. When artificial containers were found to be actual or potential breeding places for mosquitoes, recommendations for their control were made to the occupants of the house, and a record made for use in subsequent inspections as to the character of such containers, together with the house number and name of the tenant or owner. A survey map was prepared of each unit, showing each home with reference to its location to permanent breeding places. Such places as were found to be breeding, or thought likely to breed, were located on the map thus prepared and designated by letters or numbers for future reference in the weekly inspections.

ACTUAL CONTROL OPERATIONS

Methods Pursued—The control measures employed consisted exclusively of drainage and oiling. All streams thought to influence the incidence of malaria by producing a sufficient number of anopheles to become of sanitary importance were cleared and regraded, or otherwise treated so as to insure rapid run-off of the normal waters. Such major obstructions were removed from the bottoms of streams as would retard the normal flow of waters or prevent the formation of complete films during subsequent oilings. In clearing the streams of their obstructions, special effort was made to remove all overhanging brush that, by coming in contact with the normal flow of water, could produce favorable places for the mosquitoes to rest and deposit their eggs. As a rule, it was found necessary to remove the underbrush from one side of the stream only, as this was found to give free access to the water during inspections and oilings. Wherever practicable, narrow ditches were cut in the bottom of wide ditches so as to confine the receding waters after heavy rains to narrow banks. New ditches cut for the purpose of drain-

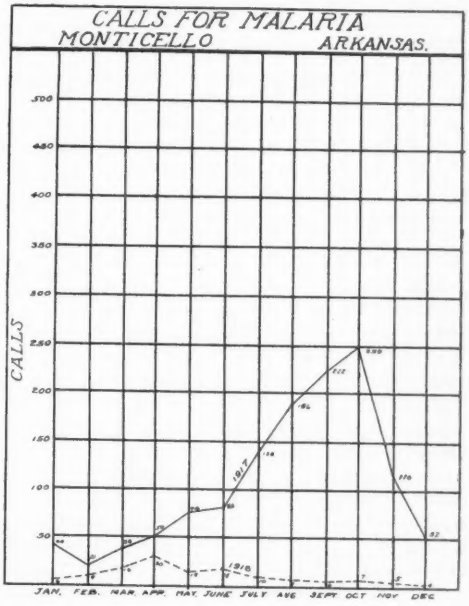
ing known breeding places were constructed as narrow as possible, remembering that cattle are less likely to trample the bottoms of deep, narrow ditches, while in wide bottom ditches, where cattle are permitted to roam, small isolated areas due to hoof prints can often be seen in which mosquitoes may breed without



fear of being molested by any of their natural enemies. Whenever possible, such ditches were joined to permanent streams at an angle of less than 90 degrees in order that the abnormal and initial flow during heavy rains might be thrown more nearly in the direction of the natural flow.

OILING OPERATIONS

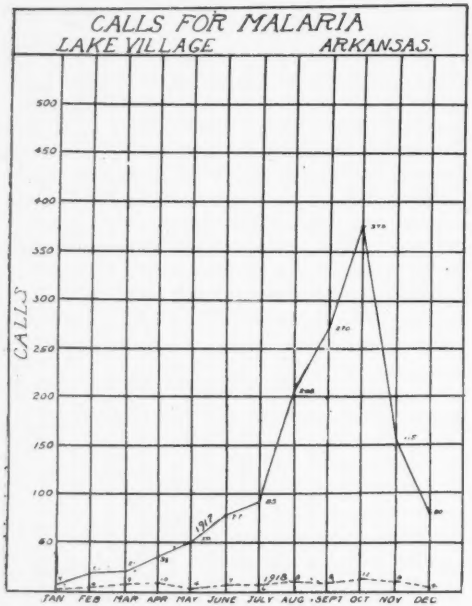
Owing to the exceedingly flat lands in southeast Arkansas, as at Lake Village and Dermott, it was found impossible to establish sufficient grade to the drainage ditches to convey the surface water rapidly after heavy rains to the near-by streams. This resulted in sluggish streams, which afforded excellent opportunities for the propagation of mosquitoes. Such streams were often found to harbor anopheles larvae, although grass and shrubbery had been previously removed from the banks. For stream control, drip cans were first installed. These were five-gallon galvanized iron cans, equipped with adjustable screw stop cocks. On each stream the cans were placed at a distance of about 200 yards apart, at an elevation of about four feet, and so regulated as to deliver about 15 to 20 drops of oil per minute, an effort being made in each case to have the droplets of oil fall upon some rapidly moving portion of the stream. To accomplish this, artificial riffles were often produced by placing some obstruction in the stream and allowing the water to flow over it. Due to the fact that the small opening in the faucet became partially clogged with the heavy substances of the crude oil, and that unbroken droplets of oil were often noted upon the surface of the water, this method of distributing oil was discarded in favor of the Meyes knap-sack pump sprayers early during the season. The spraying was done once each week, being preceded in



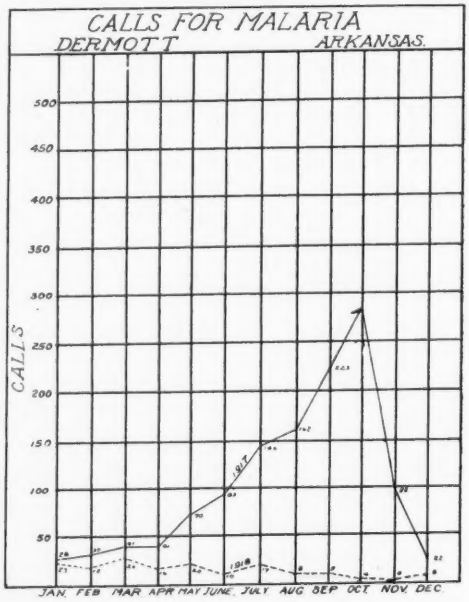
each case by a thorough inspection. The Inspectors were taught that while the presence of young larvae indicated breeding, it did not necessarily mean production unless there was evidence of full-grown larvae and pupae. This method of having each oiling preceded by a thorough systematic inspection brought about a great saving in the amount of oil as compared with the oiling operations in previous demonstrations.

ARTIFICIAL CONTAINER CONTROL

The passing of an ordinance by the town officials in each town making it a misdemeanor for the tenants or occupants of a house to maintain artificial containers upon the premises, brought about a clean-



up campaign at the very beginning of the work, and as the ordinance made it obligatory on the part of the people to clear the premises of such dangers, this movement largely eliminated such containers. However, in the course of operations, it was found that there were some containers where town water was not available, and these were considered as necessary evils and were permitted to remain after first determining this fact. In such cases, the name of the occupant and number of the house was recorded. These were controlled by screening with a double thickness of tow sack, or with wire screens, 15 mesh. Such premises, thereafter, were inspected every two weeks throughout the season, while the remainder were inspected once a month. The people were requested to submit a written report of the presence of mosquitoes to the local inspector, giving the location and number of each house. By using the above information, a plat was prepared from which an idea could be gained as to the most probable source of breeding in any particular case. In a great many instances, inspection showed that the presence of mosquitoes was due to neglect upon the part of the occupants to keep the containers properly covered. As the campaign progressed step by step and the natural breeding places, or places of choice were brought under control, it was found that anopheles mosquitoes were depositing their eggs in almost every conceivable artificial container. Of special importance from a sanitary standpoint were the horse troughs, water barrels and cisterns, and in order to bring about complete control, it was found necessary to inspect these at regular intervals and apply control measures with the same degree of thoroughness as in the natural breeding places, or places of choice. This active campaign for the control of all mos-



quitoes was doubtless one of the most important factors in gaining and maintaining the moral support of the general public.

RESULTS

The results of the efforts for the control of malaria by controlling the production of mosquitoes first became apparent about the latter part of May, as, at this time, there was an almost complete absence of mosquitoes of all varieties. The

local citizens, as a whole, some of whom were skeptical as to the feasibility of the plan at first, entered heartily into the spirit of the work as soon as it was shown that there was a marked reduction in the number of mosquitoes, not only malaria bearers, but all varieties. In giving the detailed results accomplished it should not be inferred that they were entirely due to control measures, for it is stated by the local physicians that malaria was less prevalent during 1918 than for several years previous.

The degree of control gained with reference to the cost and population influenced may be shown as follows:*

Reduction in the incidence of malaria as ascertained by comparison of total calls for 1917 and 1918 (approximate)	88 %
Reduction in the incidence of malaria as ascertained by comparison of repeated history indices	72.64 %
Total population influenced	9,980
Total cost of malaria control operations, exclusive of medical supervisor	$8,383.20
Per capita cost	.84

The accompanying charts show in graphic form the reduction in the incidence of malaria as obtained in each unit.

OFFICIAL AND PUBLIC APPRECIATION OF THE WORK

On completion of the campaign, November, 1918, the officials of each town requested the State Board of Health to continue operations during 1919. Many letters were received from private individuals asking also that the work be continued. As a direct result of this campaign, other towns were induced to take up the work during this year and a systematic campaign was begun in Eudora, McGhee, Tillar and Blissville during April, 1919, the data for which are not as yet complete. Those in charge have found little trouble in getting the local officials in near-by towns to appropriate sufficient funds to conduct similar campaigns, which bears out the statement that possibly the best educational measure in any community is the successful demonstration of what can be done in the control of a given disease.

DISCUSSION

Mr. J. A. LePrince, U. S. Public Health Service, Memphis, Tenn.—I would like to ask Dr. Taylor whether in his work he has had many complaints from the farming population about injury to cattle in places where the oil-treated water runs through pastures; also whether as a result of deep ditches there is any tendency for stock to have broken legs or to get hurt?

Dr. Fricks, U. S. Public Health Service—I would like to ask whether he has had any embarrassment from an influx of culex mosquitoes in the latter part of his work? That is partially in line with some suggestions this morning.

Mr. Fuchs, Engineer, U. S. Public Health Service—As to the question of appearing in artificial containers when they can not appear in natural places, we found in Wilmington for the last two years about three larva in the artificial container. It does not seem to be there as in Dr. Taylor's experience. We had culex, but no anopheles to speak of.

Dr. H. R. Carter, U. S. Public Health Service, Baltimore, Md.—There are two points in Dr. Taylor's paper that should be discussed. One is oiling only when you need to. There is a big difference between breeding and production. If you oil by routine you more or less prevent breeding. No one cares two cents whether they breed if they don't produce. I had almost the fight of my life at Newport News. The Sanitary Officer held the work was inefficient because the places we had oiled some weeks or days ago were breeding anopheles. I said that if it was not breeding anopheles we had oiled it wrongly. You do not care to prevent breeding, only production, and you do not oil until the place is breeding. If it does not breed, it does not need oiling and by inspecting instead of doing routine oiling you can save one-half to three-quarters oiling.

I read an article on mosquito control by an eminent entomologist who spoke of keeping a film of oil constantly on the water. If the cycle from the egg to the image takes about sixteen days, it does not matter whether you have any oil or not until the sixteenth day. We might not run as close as that, but it is not necessary to have a permanent film of oil. We have no objection to seeing larva, but seeing large larvae or pupae—that is too close to be safe.

The next thing is preferential breeding places. I think that is my own word, and I think I am among the first, or it may be the first, to develop that idea. In Panama the stegomyia bred in cisterns, etc. We made that impossible and they took to the gutters. We took those down and they began breeding in water caught in leaves. I showed Murphy, our Sanitary Officer, where they were breeding in most unexpected places and he said: "Well, they have got as much sense as I have," and added, "a heap more time." We met that by putting out good places for them to breed in the shade and every Saturday we turned them over. I judge that anopheles does the same thing. When the preferential place is destroyed she takes the next best thing. She is almost bound to oviposit, and if she does not get the best, she will take the next best.

At Chapawamsic, near Quantico, I was so impressed with this idea that I declined to cut

*These figures, and the statistics given in the accompanying graphs, are believed to be entirely accurate, but they have had to be hastily assembled for the purpose of this paper. They are subject to slight revision upon further analysis of the records.

down the lotus plants and thus destroy a very profuse breeding place of which I could control the production by oiling, fearing that if I did the first, they would go over to an island near there, the control of which had been extremely difficult. I left the lotus plants for a "trap breeding place," just as we put out the pans for the stegomyia. I am sure that I have seen this phenomenon illustrated over and over again during our studies on impounded water, where A. quadrimaculatus left places in which they had bred and went to those which they liked better.

I am willing to say that I have practically not seen breeding of anopheles in artificial containers of sanitary importance. Of course I have seen breeding in such containers over and over again. This seems to be the case, generally, east of the Mississippi. The contrary unquestionably occurs in Arkansas and north Louisiana. The statements of von Ezdorf, Taylor, Mayne and others are indisputable.

Mr. H. W. Van Hovenberg, Texarkana, Ark.—We have had considerable experience in Texas with artificial containers and have found a number of instances of anopheles breeding in them, but personally I have never seen an anopheles pupae in a semi-closed artificial container. I have found them in horse troughs and some few in rain barrels. Possibly, we do not find anopheles in artificial containers in some instances because of the fact that the culex destroy the anopheles. We find culex by themselves and anopheles by themselves, but seldom find both in the same container.

Dr. Bagger—In regard to the place of breeding, in many instances we found nothing but anopheles. There was culex started.

Dr. C. W. Garrison, Little Rock, Ark.—In many localities in Arkansas it is difficult to decide what is the preferential breeding place. As early as 1913 Dr. von Ezdorf, in making surveys in Arkansas, discovered that in many instances in many sections anopheles bred and not only bred, but produced, in artificial containers. While there was a natural ideal little stream, not two hundred feet away, we found anopheles in all sorts of places, quads, and under all conditions. We had all the natural breeding places and in close proximity there was breeding in artificial containers. In talking with various men who made the survey, they seemed to think this peculiar to Arkansas.

Dr. Carter—That is peculiar to the Mississippi valley.

Dr. William Krauss, Memphis, Tenn.—It may be of interest to know that artificial containers should be controlled by the population rather than by the authorities. When we began work in Memphis, in spite of all the work done by the authorities, there were mosquitoes. When a complaint would come in we answered: "You ought to be ashamed to admit that you have them there, for it is your own fault." This made them appreciate their own responsibility.

Dr. Carter—The first I heard of artificial containers was in the work done under Koch's direction at Grosseto in 1899. You have seen a great deal of the breeding places, Dr. Howard. How about artificial containers?

Dr. H. H. Howard, Jackson, Miss.—With respect to anopheles breeding in artificial containers, we have not found it taking place in the rural sections where our work is. This is probably due to the fact that conditions in rural areas differ from those in towns as regards the number and nature of breeding places. Last year, in 1918, we were rather surprised to observe that during August and September, when 40 to 50 per cent of the natural breeding places dried up, there was not the increase in mosquito breeding that we had expected in those water deposits remaining. I believe that this year, 1919, we have only found one instance of what might be called the breeding of anopheles in artificial containers.

Dr. Taylor (closing)—With reference to the artificial containers, I included that naturally expecting to be called, but we have been following that in Arkansas year by year and step by step. We first observed it at Pine Bluff and next at Helena, Stuttgart and various places in the State. As to whether they breed in sufficient numbers to become of sanitary importance, I do not know. I can only guess as to that, but I know this: that we have found and counted as high as 76 adult larvae in small watering troughs. Those conditions did not exist prior to control measures. After we began the control measures we found them breeding in tin cans, found them breeding in railroad tanks, found them breeding in cellars (but I do not believe you could call that an artificial container), and found them breeding in shallow wells fifteen feet deep.

As to the kind, we have hatched out a great many of these mosquitoes. In every instance they have been quads.

As to the influx of culex mosquitoes in the late fall, I do not know the reason, nor do I know of any one else who can give a reason that is not subject to question. I know that you may tighten your efforts at control during the fall and extend your zone of control, and still you will have an influx of culex mosquitoes. Why it is, I do not know. We have had them in every town we tried to control and every town I have been in has had them—that is, the adult mosquito. I do not know the species. I will be compelled to say that while our efforts at control this year have been helped in many ways, it has not been as good as before. We have had more malaria up to the first of November than we had the entire last year.

Dr. Carter—I would suggest to Dr. Taylor that he put mosquito bars over some of the artificial containers in which he finds larvae so that he can catch all the imagoes that come off and thus judge of the production. I did this for stegomyia on the isthmus and found that from the unusual breeding places but a small proportion of the larvae developed into mosquitoes. Breeding was fairly profuse in such places, but production was small. I suspect that what makes the breeding place preferential to a mosquito is that it is best suited to bring her progeny to maturity, and other places not preferential are less favorable for this.

I wish Dr. Taylor would thus see if production keeps up with his breeding.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

MALIGNANT MOLES*

By H. H. Hazen, M.D.,
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Washington, D. C.

HISTORY

Malignant moles have been known under various names for well over fifty years. Among other names given are melanotic sarcoma, melanotic carcinoma, malignant melanoma, carcinoma melanodes, pigmented cancer and naevo-carcinoma. The German literature for the decade beginning in 1870 is rich in early pathological and clinical reports. References for these articles may be found in Unna's book. In 1903, Keen and Bloodgood independently emphasized the fact that these growths almost always, if not invariably, spring from moles or naevi, and recommended that such growths be removed as a prophylactic measure.

PATHOLOGY

The following table, slightly modified from Dalla Favera and MacCallum, shows the many views that have been entertained by various pathologists as to the origin of these tumors:

1. Epidermis — Gilchrist, Kromayer, Marchand, Unna, Dalla Favera, Broders and MacCarty, Krompecher, Waelsch, Whitfield, Darier, Schalek and Ravogli.

2. Mesodermal—(a) Young connective tissue cells, Simon, Virchow, Riecke, Adami; (b) proliferation of lymphatics, von Recklinghausen, Lubarsch, Herxheimer, Johnston, von Demieville; (c) endothelium and perithelium of the blood vessels, Pick, Jadassohn; (d) sheaths of nerve fibers, Soldan.

3. Specially characterized cells of mesodermal origin chromatophores, Ribbert.

*Read in Section on Surgery, Southern Medical Association, Thirteenth Annual Meeting, Asheville, N. C., Nov. 10-13, 1919.

Fordyce has reviewed this work very carefully. He states: "In some the character of the cells conforms more closely with those of the epidermis, and can hardly be distinguished from the prolongations of the latter, which enter the mole. In others there appears to be another variety, consisting of cells with vesicular nuclei, with faint or no tinctorial properties and a well-defined border. Their shape in general is round, but this may be modified by mutual pressure. Fibers from the connective tissue may be seen between individual cells and groups of them."

Malignant mole arising from pigmented nævus of temple. Note the nodule in the corner next to the eye.

To the author the following conclusions seem irresistible: (1) many naevoid cells spring from basal cells of the epidermis; (2) possibly certain naevoid cells arise from other tissues than the epidermis; if this be the case endothelium is probably the source; (3) malignant melanomata of the skin spring directly from these cells; (4) melanotic growths may spring from other organs as from the choroid, the gall-bladder

(Duvall), adrenal (Orth), and many other organs; (5) lymphangio-endotheliomata are not nearly so malignant as these tumors; (6) basal-celled carcinomata are certainly not as malignant as this group. The whole question, then, is still unsettled, although it seems probable that some of these tumors are carcinomata and some sarcomata.

Microscopically, a fully developed tumor shows either an alveolar arrangement of large or small cells, bundles of spindle and oat-shaped cells, or a combination of the two, the picture varying in different portions of the same tumor. The amount of chromatin varies; in some fields not only the cell nucleus may be obscured, but even the cell shape, while in other fields it is present in comparatively small amounts. Borst has pointed out that there was more pigment near the great blood vessels. The melanin, which is the pigment present, is in the form of fine amorphous granules, varying in color from a golden yellow to a very deep brown. It is generally conceded to be the final stage of the cell, and, where there is most, the cell is the oldest or the best nourished. As regards the origin of the malanin, it is still undetermined whether it arises from the blood, or whether it originates in the cutis or the epidermis.

CLINICAL COURSE

In dealing with clinical forms it is wise to bear in mind the words of Unna, who states: "Since the melanocarcinomata of the skin always take their origin in pigmented moles, and, on the other hand, there can hardly be nevocarcinomata completely without pigment, it is well to describe together these two groups of tumors, which are combined by graduual transitions. And, further, in every other aspect, the rapidly growing, pigmented carcinomata of alveolar structure, which soon lead to infection of the lymphatic glands, to more or less melanotic metastasis and a fatal termination."

Many extensive articles dealing with the clinical course of these growths have appeared. Among them may be mentioned those of Bloodgood, Pringle, Stowers, Galloway, Hartzell, Eve, Dubreuilh, and two other notable recent articles, those by Coley and Hoguet and by Broders and MacCarty.

Clinically these tumors have their origin in nevi, either congenital or acquired, but usually in flat, deeply pigmented non-hairy moles. There are at least five different clinical types. First, it may be noted that sometimes before, and sometimes shortly after, changes are observed in the original mole, other spots make their appearance in the skin. These nodules may be either in the skin or deep in the subcutaneous tissues. These lesions may be deeply pigmented, may be markedly vascular or they may be totally without evidence of pigmentation. Signs of visceral disturbance frequently arise early and the patient always dies speedily. Second, there may be marked evidence of metastasis in some of the internal organs. Usually the liver and frequently the stomach are also involved and there are but few cutaneous manifestations and there may or may not be glandular enlargement. Third, there may be a very marked involvement of the neighboring lymph nodes when there is no other sign of trouble than changes on the mole. As a general rule in this type the original tumor is comparatively large. Fourth, involvement of the lymph nodes does not become apparent for a number of years and further extension of the disease is slow. Fifth, pigmentation may develop around the edge of either the finger or toe nail. "Melatonic Whitlow," of Hutchinson.

CASE HISTORIES

Many of the points just mentioned under clinical course can be well illustrated in the author's series of seven cases:

Case 1.—White female, age 50, farmer's wife. She had had the ordinary deeply pigmented non-hairy mole upon the extensor surface of the left forearm. One day it was pecked by a hen so as to bleed. Several months later the mole began to grow and slow ulceration to manifest itself, when the growth was excised by a local physician. One year later there was a local recurrence and this was also excised. Two years later there was still another recurrence and this time there was wide operative removal and at the same time a number of enlarged, deeply pigmented lymph nodes were taken out from the lower portion of the axilla. Two years later, or five years after the appearance of the original trouble, there was an inoperable recurrence in the axilla. In this case early amputation and possibly a complete removal of the axillary glands would have saved the life of the patient.

Case 2.—White male, age 50, farmer, was seen by me because of a mole upon the right

forearm which had become irritated, and because of painful lumps in axilla. His history showed that he had had a deeply pigmented, slightly raised non-hairy mole upon the flexor surface of the right forearm and that following slight trauma six weeks ago the mole had almost immediately begun to grow. Examination disclosed a black, fungiform, firm tumor about one-half inch in diameter upon the forearm and in the axilla a mass of soft, enlarged, tender lymph nodes. Operation showed these to be deeply pigmented and inoperable. The man died within six months of this time, apparently from local spread rather than from metastasis.

Case 3.—Negro male, age 44, laborer, entered Freedmen's Hospital because of a sore upon the bottom of his foot and enlarged lymph nodes in the groin. The history showed that six months previously he had stuck a nail in the mole upon the sole of his foot and that the resultant sore had failed to heal. Two months before treatment at the Hospital enlargement of the glands was noticed. Examination revealed a black, ulcerated area of more than one-half inch in diameter upon the sole of the right foot; the inguinal glands on both sides were markedly enlarged, some about two inches in diameter. He also complained of a cough and upon the day following his admission to the Hospital he coughed up a considerable quantity of blood which contained fragments of melanotic tumor. Within a week death occurred.

Case 4.—Patient was an active, robust young woman, 28 years of age, who had had a mole upon the left hip. While mountain climbing she fell, bruising this mole. Within two weeks some growth was noticed and a month after her accident a wide local excision was done, and within two months the liver showed signs of enlargement. A few days later subcutaneous non-pigmented nodules began to develop upon the limbs and body. Six months after the original accident she was dead.

Case 5.—Railroad brakeman, 26 years of age, consulted me because of a flat, deeply pigmented nevus upon the right temple. On the anterior border of this was a raised, jet-black, soft, nonfriable nodule. No enlarged glands could be found. He stated that eighteen months previously a local physician had attempted to excise a portion of the nevus and that this later nodule had been present for nearly a year. Two excellent surgeons declined to operate, and because of that I attempted intensive roentgen therapy. The local growth and also the nevus entirely disappeared after the second treatment. Six months later the preauricular lymph nodes became much enlarged within twenty-four hours. These likewise disappeared under roentgen therapy, but within a few weeks all the cervical nodes became involved and these absolutely refused to yield to x-ray. Within two months he showed signs of metastasis in the brain, spinal cord and stomach, and a few weeks later hundreds of non-pigmented subcutaneous nodules developed. Within a month's time death occurred.

Case 6.—White female, age 48, was seen because of a small nodule upon the left leg. Examination showed a lesion in all respects identical with the one described under the preceding case history except that there was no nevus present, nodules having arisen from a mole. Rubbing from the shoe top was undoubtedly responsible for the irritation. Under general anesthesia, Dr. Balloch assisting, a wide area of skin and subcutaneous tissue and fascia was removed. Microscopic examination showed conclusively that the lesion was typical of malignant mole. Recovery was uneventful and patient is alive and well today, three and one-half years after the operation.

Case 7.—Patient was an active, healthy young man, 26 years of age, and was seen in consultation with one of the local draft boards. He stated that one year previously a flat, slightly scaly, non-hairy mole or nevus about one-half inch in length by one-quarter of an inch in width upon his back had been irritated by his suspenders and that a small local nodule had appeared. This had been excised, but speedily returned. Second extensive operation resorted in local cure, but within two months numerous deeply pigmented subcutaneous nodules had developed. Radium caused these to slightly diminish in size. Obviously he had also metastasis in the stomach. Death occurred about six months after I saw him.

PROGNOSIS

The majority of these cases end fatally. Bloodgood reports but one recovery in his series of cases. Broders and MacCarty report a mortality of nearly 90 %; it should be noted that these two authors include under their mortality statistics melanotic growths of the eye which have a not unfavorable prognosis if taken early. Six out of seven of my cases are dead. As a rule the patients die inside of two years.

TREATMENT

Prevention is much better than cure. Every acquired mole should be removed, preferably by cautery. Every congenital mole which is liable to irritation should likewise be removed by the same method. Whenever a mole begins to grow or to show signs of either irritation or ulceration it is an imperative sign for immediate extensive operative interference, preferably with the cautery, though this will often be too late. When numerous metastases have appeared treatment is useless. In the cases where involvement is only in the lymph nodes extensive block dissection might occasionally effect a cure. I know of two such cases which have been well nearly six years following intensive roentgen-ray therapy.

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DISCUSSION

Dr. Joseph C. Bloodgood, Baltimore, Md.—I feel in regard to the treatment of moles very much the same as I do in regard to the treatment of peritonitis and advanced carcinoma of the breast and of the uterus. I am quite confident that radium offers very little, and surgery nothing at all.

Dr. Hermann B. Gessner, New Orleans, La.—I do not think the profession has been fully educated in the matter of carrying on propaganda in regard to these lesions. They should be taught to get these lesions earlier. I always express my pleasure when patients come to me early with pre-cancerous lesions, for I like to get such lesions in plenty of time. In dealing with students I am very fond of quoting a slogan that I believe Dr. Bloodgood is responsible for,—"Major diagnosis and minor surgery, not minor diagnosis and major surgery."

PRE-CANCEROUS LESIONS OF THE BREAST WITH SPECIAL REFERENCE TO CHRONIC CYSTIC MASTITIS*

By J. S. Rodman, M.D., F.A.C.S.,
Philadelphia, Pa.

It is natural that in this post-war period the surgeon's attention should be largely turned to devising and carrying out new methods of reconstructive surgery. We should not forget in doing so that surgery still is engaged in warfare against cancer and that the results obtained today, brilliant as they are when compared to those of four decades ago, must still be greatly improved. Figures are at times misleading, but it is food for thought to consider that during the two years we were actually engaged in war 76,433 soldiers were killed or died of wounds or disease, and that during the same period 180,000 people died of cancer in the United States; that cancer ranks with pneumonia, heart disease, tuberculosis and kidney disease as the chief causes of death.

Among the most common organs to be attacked by cancer is the female mammary gland. It has been estimated that about one-third of the total number of cases of cancer occur in the stomach and that about one-fourth in the breast. Therefore, annually approximately 25,000 lose their lives because of cancer of the breast. Were it not for surgery many more would do so.

It would seem that, since Moore, of England, as long ago as 1867, definitely showed cancer to be in its beginning a strictly local process, the mammary gland would offer to surgery one of its most promising fields for cure, inasmuch as it is a surface organ and, therefore, more accessible to early diagnosis and radical extirpation. This has proven to be true in comparing the results obtained from the operative treatment of breast cancer and that of the stomach, uterus and gallbladder. Many thought that Dr. S. W. Gross was a misguided optimist when, forty years ago, he claimed to cure 10% of his cases; but we have seen these statistics improve since then through the

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work of Sir Mitchell Banks, Halsted, Willy Meyer, Warren, Handley, W. L. Rodman and others, until now we can show 72 % of three-year cures and 50 % of five-year cures. I have recently traced 68 private cases operated upon by my father and myself. Of these, 49, or 72 %, are well three years and over; 34, or 50 %, five years and over; 14, or 25 %, ten years; and 6, or 8 %, fifteen years. Others have reported an equally large percentage of five-year cures (Dennis, Cheyne). The cases in our series were taken consecutively: some were early, some had axillary metastases and three were ulcerating tumors. It is not possible to lay down hard and fast rules concerning the operability of a given

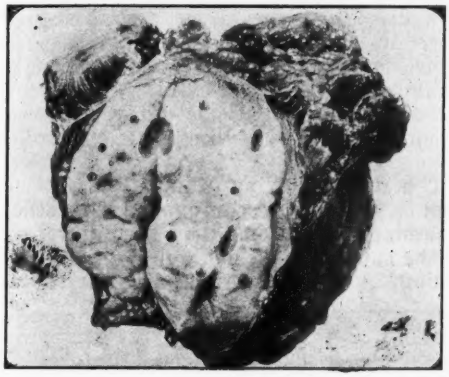

Fig. 1.—Gross appearance,—cysts and fibrous stroma.

case. As the three ulcerating tumors in this group show, even such advanced cases should be given a chance. However, it is undoubtedly fairer to set five years as the limit of cure rather than the three-year period of Volkmann so commonly accepted. The great improvement in these statistics from those of four decades ago is due largely to the development of the radical breast amputation.

S. W. Gross cured 10 % by using a large skin incision when his contemporaries were not curing any, and since his day the operative procedure has become so extensive that the modern technic leaves nothing to the imagination for the future. If, then, amputation of the breast as now done can not be made more extensive, and since the best available statistics only show 50 % of five-year cures, how can we improve our results. The writer believes that it can only be done by operating in the pre-cancerous stage. There is a time in the life history of every cancer of the breast when it can be removed completely and without even the probability of re-

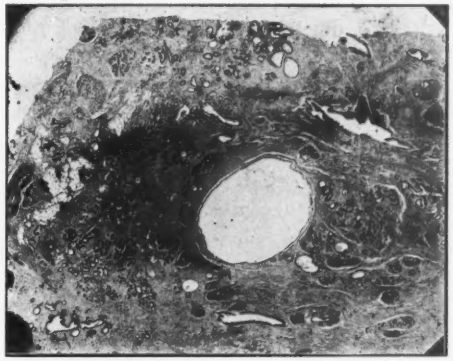

Fig. 2.—Cystic type of chronic interstitial mastitis (microscopic).

currence or metastasis. Our problem, then, is to get our cases at this time. I realize that this is easily said but extremely difficult to carry out, but there is, in all probability, a way of doing it. In order to do so we must not only continue to educate the public to the very earliest symptoms of cancer of the breast,

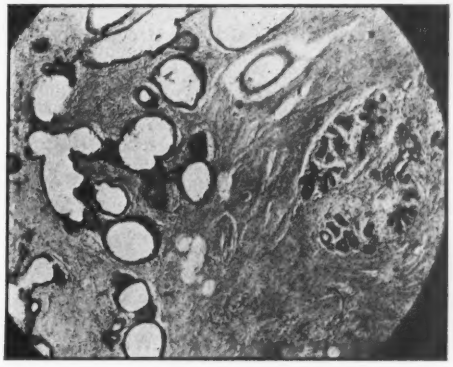

Fig. 3.—Cystic type of chronic interstitial mastitis (microscopic).

but even go further than this by preaching that any abnormal condition of the breast has the potential danger of becoming malignant, and, therefore, must be carefully watched by a physician who thoroughly understands it. The Society

for the Control of Cancer has done much in recent years to spread such information and should be encouraged in every way. But of equal importance is our own education to the fact that it is never safe to lightly advise any woman suffering with a benign tumor, cyst or chronic cystic mastitis to delay operation because her particular case is, as yet, not malignant.

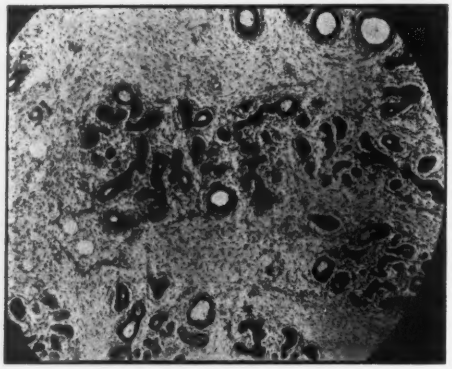

Fig. 4.—Proliferative group,—acinal type (microscopic).

Of course I do not mean to imply that there is any certainty that any given case of benign disease will become malignant, but some will do so, and it is always impossible to say which it will be.

In analyzing 200 consecutive cases of breast disease, W. L. Rodman found the following:

	Number	Per Ct.
Carcinoma	83	41.5
Abnormal Involution (Chronic Cystic Mastitis)	67	33.5
Benign Tumors	30	15
Papillary Cyst Adenoma	6	3
Tuberculosis	6	3
Sarcoma	5	2.5
Galactocele	3	1.5

From this analysis it will be seen that abnormal involution or chronic cystic mastitis is the most common disease of the breast next to carcinoma. We shall put aside for the moment this most interesting condition which we shall take up in detail later and dispose of some of the less common pre-cancerous lesions.

In our experience papillary cyst adenoma, characterized by a centrally-located cyst with intra-cystic papilloma and of which a discharge of pure blood from the nipple is pathognomonic, is so malignant in its tendencies as to be considered and treated as cancer. Five of our six cases were shown to be malignant by the microscope. The benign solid tumors, fibroadenoma and intracanalicular myxomas are less liable to malignant degeneration and yet we know that the latter, intracanalicular myxomas, do undergo sarcomatous change.

One of the five cases of sarcoma in the series of 200 unquestionably had developed from a pre-existing myxoma. A benign cyst in our experience is usually associated with either the fibrous or cystic type of chronic cystic mastitis in other parts of the breast and, therefore, may be considered as this disease. Because of the fact that next to carcinoma it is the most common disease of the breast and that in a more or less definite percentage of instances is proven to be microscopically malignant, though clinically benign, chronic cystic mastitis is easily the most important of all of these pre-cancerous lesions.

This disease, owing to its varied nomenclature, has been so confounded with other mammary conditions that the literature of the subject could not well be more confusing. A review of some of these names

Fig. 5.—Proliferative group, papillary type, papillary in-growths into acinal lumen (microscopic).

will not only serve to show the great diversity in the viewpoints of different clinicians, but to direct attention to some of the ordinary clinical and pathological characteristics of the disease, and will furnish a clue to what is of greater importance—its potentialities as an important etiolog-

ical factor in the production of carcinoma unless it be recognized earlier and treated more radically than has hitherto been done. We believe that general practitioners and surgeons almost equally, either wholly overlook the disease or fail to give it the attention that its frequency and fatality warrant and shoud demand, since it is clearly the most common of all pre-cancerous conditions of which we have any defi-

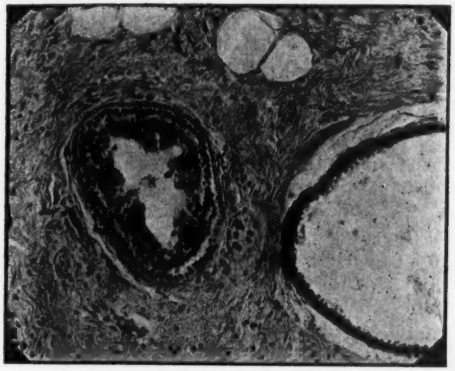

Fig. 6.—Proliferative group. High-power appearance,—papillary in-growths of epithelium (microscopic).

nite knowledge, and, moreover, is both easy of recognition and susceptible of cure.

A writer and pathologist of the first rank, Wilson of the Mayo Clinic, has stated that, in the literature upon the subject, this disease has been described under not less than a dozen names. It would serve no useful purpose to review them all. Therefore, we shall mention only a few of those having more or less general acceptance, such as chronic mastitis, chronic cystic mastitis, general cystic disease, hydatid disease (Cooper), fibrous and glandular hyperplasia with retention cysts (Whitney), senile parenchymatous hypertrophy (Bloodgood), abnormal involution (Warren), intra-acinous cystic epithelioma (Reclus), cystadenoma (Schimmelbusch), etc.

Of all these contributions to the nomenclature, none is without valid objections. The pathological definition of Whitney, "fibrous and glandular hyperplasia with retention cysts," seems to us more strictly accurate than any other. The appellation of Reclus, "intra-acinous cystic epithelioma," suggests the malignant tendencies of the pathological processes, although it may emphasize them too strongly. Furthermore, it takes no account of the fibrous, interstitial or connective tissue changes always present and precedent to the epithelial, both acinal and ductal, changes. Yet by this definition Reclus accentuated what other astute observers before him had not so fully appreciated—the tendency of the disease to terminate in carcinoma. Despite theoretical objections to this name, its general adoption would have prevented much of the clinical confusion which has prevailed during the past generation.

Warren's name—abnormal involution—is short and suggestive, inasmuch as the disease occurs most frequently at the time when the breasts are undergoing normal involution or structural decay. But it also occurs very often in young women, and occasionally in old ones, so that it may lead to confusion with both pathologist and clinician. We have often encountered the disease between 30 and 40, not infrequently between 20 and 30, and in two instances in girls of 16 and 18, the former

Fig. 7.—Further stage of papillary and adenomatous type, benign (microscopic).

being bilateral and in the latter unilateral. We have also operated reasonably often in women past 60, and twice in those beyond 70. Therefore, it is questionable that the disease should be considered only as an aberant process.

Chronic mastitis seems to be the simplest of names, but may be both mislead-

ing and inaccurate if it implies a simple, chronic inflammation following acute mastitis, puerperal or otherwise, and not resulting in the formation of secondary cysts.

Chronic cystic mastitis is not strictly accurate, either, since cysts are secondary to, and largely the result of, compression of the ducts by hyperplasia of the connective tissue with consecutive dilatation and

Fig. 8.—Adenomatous type, benign (microscopic).

cyst formation. To overcome the objections to both terms—chronic mastitis and chronic cystic mastitis—we have ventured to call the disease chronic interstitial mastitis with or without secondary multiple cysts.

Three important and more or less widely accepted theories stand out prominently in explanation of the morbid process — the inflammatory, neoplastic and involutionary. In support of each there is evidence. The inflammatory or infectious theory is the oldest and has always had a more general acceptance accorded it than any other, having been extensively supported by British, French and German pathologists; though in recent years, under the leadership of Schimmelbusch, many of the Germans adhere to the neoplastic or new formation theory. But the inflammatory theory had the weighty endorsement of Virchow and Billroth, the latter calling the disease chronic cirrhosing mastitis—one of the very best of the many names suggested—and it is still vigorously supported by Koenig and others. Very recently the Italian school of pathologists, notably Marangoni, Barbacci, Verga and Franco, has contributed noteworthy evidence in its support. Of these, Marangoni studied 80 cases from the Surgical Clinic, at Padua, 14 cases being selected for serial section. He believes that because of the topographical distribution of the lesions; the co-existence of changes in the fibrous and epithelial constituents of the gland; the absence, not only of a capsule, but also of any distinct line of demarcation between the diseased areas and the normal mammary tissue — the involvement in some cases of the whole breast in a diffuse diseased process without there being any change, or at most only a very slight one, in its gross topography; and, finally, because of the chronic inflammatory condition involving the nearest lymph nodes, namely, those of the axilla, the disease should be classed with chronic inflammatory processes.

Schimmelbusch, as we have intimated, was the first to advance the neoplastic or new growth theory of the disease, desig-

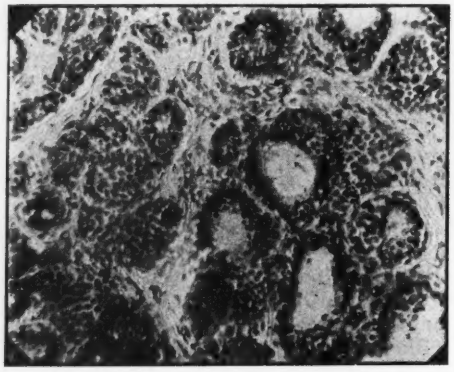

Fig. 9. — Adenomatous type and malignant change,—carcinoma (high power microscopic).

nating it as cyst-adenoma, and he has been followed, more or less, in Germany and elsewhere. While it can not be denied that the process is at times a circumscribed one and the epithelial proliferation in the acini so marked as to mimic tumor formaportion of one or both breasts and, there-

fore, utterly at variance with our universally accepted definition of tumor formation very closely, more frequently by far it is a diffuse process involving a greater tion.

Warren, who did not accept either of the above theories, attributed the changes to an exaggeration of the normal processes in the involutionary cycle of the breast, and, therefore, designated the disease as abnormal involution. However, we believe that the inflammatory theory is the correct

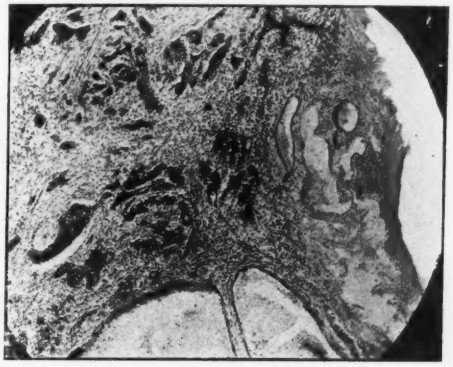

Fig. 10.—Carcinoma and chronic cystic mastitis in same section (microscopic).

one. Clinically, we know that carcinoma is prone to develop upon inflammatory lesions which are subjected to irritation, as, for example, cancer of the skin, of the lip, or of the stomach, of the uterus, of the gall-bladder, etc.; also that so-called abnormal involution occurs in very young women — much too young for involution changes to make their appearance—while from the pathological standpoint the widespread nature of the process, the round cell and leucocytic infiltration, and the inflammatory involvement of the neighboring lymph nodes, would seem to be convincing.

We have accepted Warren's classification of the different types of this disease, the cystic and proliferative. In the cystic form the changes are predominantly in the stroma of the gland. The fibrous tissue being increased, it presses on the ducts and thus leads to the formation of retention cysts. In the proliferative form the changes are chiefly in the epithelial parenchyma, and may be divided into three subgroups: (1) the acinal, in which there is an increase in the actual number of acini; (2) the proliferative, in which the epithelium is piled up and projects into the acini; and (3) the adenomatous, in which there is still greater epithelial proliferation, the acini being practically one mass of cells. The latter has the most pronounced tendency to become malignant.

Clinically, it is quite impossible to distinguish between the several varieties. The macroscopic appearance of the breast is characteristic. On section many cysts are seen, ranging in size from the smallest bird shot to a walnut. The cyst contents also vary widely; the contained fluid being as clear as spring water, amber colored, greenish, brown, or even black, suggesting altered blood. The breast tissue between the cysts is distinctly fibrous, decidedly whitish in color, tougher than normal, and, therefore, far more resistant on section. These gross changes are quite unlike those

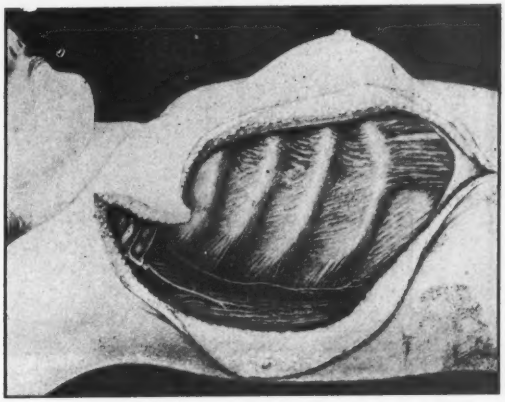

Fig. 11.—Wound after removal of breast, underlying muscles, axillary contents and sheath of rectus, by Rodman method. (Detailed description of technic may be found in "Diseases of Breast," Rodman, p. 287.)

of typical carcinoma, which is gray in appearance, much harder, creaks under the knife, retracts and is concave after section, and exudes an abundant juice upon scraping. Therefore, to one who has seen much of both diseases, the macroscopic differences are sufficiently marked to permit easy diagnosis. What may not be revealed to the naked eye is whether or not

incipient carcinomatous change has already begun. The microscope, and it alone, can determine this with reasonable certainty and it should always be employed and depended upon in doubtful cases at the time of operation. Warren states that 13 % of his series had undergone malignant change; Theile, 15 %; Speese, 25 %; Burtell, 26 %; and Means and Forman, 40 %. Our own experience indicates that the more recent estimates are probably correct, and that in 100 of our cases in which only a clinical diagnosis of chronic mastitis with probable cysts could have been made, we found 23 % to be already distinctly carcinomatous when examined microscopically by both frozen and paraffin sections.

Fig. 12.—Wound being sutured. Extensive undermining makes skin grafting unnecessary. No drainage is now used at lower angle of wound.

DIAGNOSIS

The diagnosis of chronic interstitial mastitis is not ordinarily difficult owing to certain fairly-constant characteristics. While rare in men, it does occur in this sex. Judd reports 11 cases in men occurring in a series of 218 cases of this disease at the Mayo Clinic. We have observed three cases in men aged 29, 45, and 65 years, respectively.

Age.—The majority of cases occur in single women, or married women who have been sterile, or in those who have not nursed their children and who have reached the menopause. In Judd's series the greater number were between the ages of 30 and 60 years. In 100 consecutive cases from our own clinic the age incidence was as follows:

10	to 19	3 cases
20	to 29	11 cases
30	to 39	24 cases
40	to 49	48 cases
50	to 59	8 cases
60	to 69	4 cases
70	to 79	2 cases

So that while it is more often seen between 40 and 50 years, it does occur in very young women and also in the aged. One of Speese's cases was 22 years old. Means and Forman's report shows 2 cases

in young women aged 29 and 30, respectively.

Three of our cases were under twenty—16, 18 and 19, respectively — and 11 occurred from 20 to 30. Therefore, it is probably more often seen in young women than in those past 60, as a study of the pathology would lead one to expect, since we would more naturally look for its development in glands still in the period of epithelial activity. Chronic interstitial mastitis is bilateral in a fairly large number of instances. In our own experience 20 % were bilateral. Others have mentioned this frequency, and indeed it would seem to be one of the interesting features of the disease.

Judd found that most of his cases were preceded by a history of acute mastitis, which was lacking in our own series.

tient into a state of false security). The pain of chronic interstitial mastitis is confined to the breast as a rule, though it may extend down the arm on the affected side. Judd states that it is different from the pain of carcinoma, which is radiating, while that of chronic interstitial mastitis is limited to the breast itself. At the menstrual period the pain is almost always aggravated, as is to be expected, since the gland is congested at this time. This clinical fact is rather in keeping with the more modern views of the pathology, since every inflammatory process leads to more pain when the vessels of the part are distended. The affected breast also increases in size at the menses.

Not infrequently there is more or less discharge from the nipple. This discharge is oftentimes a clear watery or straw-col-

DIFFERENTIAL DIAGNOSIS

Chronic Interstitial Mastitis	Carcinoma	Intra-Cystic Papilloma (Papillary Cystadenoma)
Pain a prominent symptom. Worse at menses.	Pain usually absent until late stage.	Slightly, if at all, painful.
Often bilateral, in about 33 %.	Unilateral in all but 1 or 2 %.	Unilateral.
Entire gland involved. Multiple tender areas. As a rule no definite tumor.	Single tumor, not tender.	Behind nipple; single tumor.
Skin not adherent.	Skin adherent even in early cases.	Skin not adherent.
Discharge from nipple usually clear and watery. May be blood-stained.	No discharge as a rule.	Discharge of pure blood is pathognomonic.
No retraction of nipple as a rule.	Retraction of nipple frequently present.	No retraction of nipple as a rule.
More common in single women, sterile married women or mothers who have not nursed their children.	Married women.	Married women who have borne many children.
Axillary glands frequently enlarged and tender.	Axillary glands enlarged but not tender.	Axillary glands not enlarged until late (after development of carcinoma).

Trauma has been often mentioned in the history and would, therefore, seem to be a fairly frequent factor in the predisposing etiology.

All of our cases complained of pain, or at least a sense of discomfort in the breast. In fact, this is the most dependable symptom of chronic cystic mastitis, and the one that leads to an early diagnosis in the majority of instances. Pain is especially of value in the differential diagnosis between the disease under discussion and carcinoma. As is well known, cancer of the breast, in its early stages at least, is painless (a very regrettable circumstance since the absence of pain so often lulls the pa-

ored serum exuding from the nipple, or made to do so upon pressure, if the adjacent portion of the breast is diseased. In cancer the discharge is sanious. If pure blood, it is significant of another pre-cancerous condition, papillary cystadenoma. Pain being the most pronounced of the subjective symptoms, the average duration of the disease is short compared to the length of time that usually intervenes between the first knowledge of the lump of carcinoma and the first visit to the consultant.

On examination one finds the affected breast perhaps a trifle larger than its fellow. Prominence of the superficial veins is noted sufficiently often to be always

looked for. Instead of there being one definite tumor mass as in carcinoma, there are several irregular masses which are tender on pressure and there is no adherence of the overlying skin. The axillary glands are often enlarged and tender.

THE TREATMENT OF CHRONIC INTERSTITIAL MASTITIS

To plan the operative management of chronic interstitial mastitis we must bear in mind its potentialities and err on the side of doing too much rather than too little. It is our belief that no one can be sufficiently skilled in recognizing its pathology to say definitely which case is benign or which has become or is likely to become carcinoma. Therefore, it is now and always has been our practice to have on hand a competent microscopist immediately to examine a frozen section of the portion of the gland which looks to be the most diseased to the naked eye and to abide by his decision. I am fully aware of the objections to the method which have been raised by surgical pathologists, that it is not always possible to select just the portion of the gland which is most affected, and that frozen sections are hastily made and, therefore, unreliable for histological study. However, our own experience has been to the contrary.

It is important, of course, to consider the patient's age in deciding upon the type of operation to be performed. In young, unmarried women whose chance for happiness would be lessened by removal of the entire gland, it is, I believe, justifiable to perform resections provided that the facts are made known to the patient and she accepts the responsibility. As a matter of course, this plan is to be followed only when the pathologist returns his report as benign.

I have several times removed a large part of the gland sub-cutaneously by using the same incision as when performing plastic resection by Warren's method. In this way we avoid disfiguring the patient and interferring with subsequent lactation. One of the cases upon whom this was done had well-marked bilateral chronic interstitial mastitis. She married shortly afterward, subsequently gave birth to a normal child and both breasts lactated. The cosmetic effect in her case was excellent, as the slides will show.

Wherever it is necessary to remove the entire gland I much prefer to use the same technic as though amputating the breast for carcinoma. Especially do I think it advisable to do this in women over 35. With our present technic the motion of the arm is in no way interfered with even though the pectorals are sacrificed, and as amputation by this method adds nothing to the operative risk, there would seem to be little reason for performing partial, incomplete operations.

Greenough and Simmons have traced 83 cases, all of which had partial resections of the gland only performed. Of these, 17, or 20 %, were unsuccessful. In four instances, 4.5 %, carcinoma developed in the remaining breast tissue. In five cases the disease developed in the opposite breast and in eight cases the disease recurred in the breast operated upon, gland structure already diseased no doubt having been overlooked.

Discussion follows paper of Dr. Horsley, p. 363.

BENIGN TUMORS OF THE BREAST*

By J. Shelton Horsley, M.D.,
Richmond, Va.

The popular propaganda about cancer in recent years has very considerably changed the types of tumors of the breast that surgeons now see. Formerly benign tumors were not frequently observed; and by some surgeons were even then viewed with suspicion. Women are now coming to their physician or their surgeon soon after discovering a lump in the breast. They have learned that cancer in the early stages is not painful and that a lump in the breast is always a serious matter; so they are not content with waiting indefinitely until cancer has developed so plainly that the diagnosis is obvious.

Any disease is more difficult to diagnose in the early stages than later. In tumors of the breast this difficulty is pronounced, and yet diagnosis is vital because many benign tumors of the breast are potentially malignant sooner or later, and because the chances of curing mammary cancer decrease mathematically with its growth. When large clinics are now reporting that

*Read in Section on Surgery, Southern Medical Association, Thirteenth Annual Meeting, Asheville, N. C., Nov. 10-13, 1919.

of all tumors of the breast more than 50 % are benign, it becomes necessary for these growths to be recognized and for that type of operation to be done which is best suited for the particular growth. In order to secure the best results it seems essential for a surgeon who is operating on tumors of the breast to have some first hand knowledge of the pathology of lesions of the breast. Surgeons can no longer, on the one hand, adopt indiscriminately a radical operation for every lump in the breast, nor, on the other, refuse a radical operation until cancer is only too evident.

One of the chief difficulties in classifying tumors of the breast is the peculiar nature of these tumors. This, in turn, depends upon the histologic structure of the breast and the marked changes which it undergoes during the life cycle of a woman. Hardly any two authorities present the same classification of breast tumors. The classification may depend solely upon laboratory findings which is often impracticable from a clinical standpoint; a clinical classification without microscopic examination is misleading and useless. The most satisfactory work in breast tumors has come from surgeons such as Billroth, Warren, Bloodgood and Hertzler, who have been actively interested in pathology, or from pathologists who are intimately associated with surgical clinics, like MacCarty, of the Mayo Clinic.

In order to appreciate the difficulties of classifying benign tumors of the breast, it is well to bear in mind the remarkable stages of involution through which the normal mammary gland goes. At birth this gland consists simply of an aggregation of radiating ducts with club-shaped extremities but no real acini. The epithelium of the ducts is frequently in an active state of proliferation, which may cause swelling and pain in the gland. In this way much of the so-called acute mastitis of infants is accounted for. No histologic change takes place in the gland until the age of puberty, when acini begin to develop. The breast then enlarges and becomes tender and firm. The epithelial elements in the acini and ducts grow rapidly and the ducts become intimately surrounded by a type of connective tissue which Warren has described as being clear, almost transparent, rich in nuclei, and in marked contrast to the interstitial connective tissue of the gland. It is this peri-ductal connective tissue which enters largely into many of the benign tumors, and because of its intimate association with the epithelial elements the latter are always present, even though the peri-ductal fibrous tissue predominates. At pregnancy lactation produces another marked change in the breast, and here the epithelial growth in the gland is at its height. Bloodgood has shown that the epithelium of benign encapsulated tumors of the

Fig. 1.—Photograph of a peri-ductal fibroma incised. Note the retraction of the capsule and the bulging of the tumor as though it were under considerable pressure. The cut surface of the tumor is not lobulated as is the case with fibro-cyst-adenoma. ("Diagnosis and Treatment of Tumors of the Breast," by J. S. Horsley, M.D., Virginia Medical Semi-Monthly, April 7, 1911.)

breast may take on marked growth during lactation of the mammary gland and the microscopic picture under such conditions may be mistaken for cancer. The next change in the mammary gland is that which accompanies the atrophy and degeneration of age and disuse. This change usually begins about middle age and occurs particularly in the acini and in the interstitial tissue. The epithelium in the acini may degenerate and choke the ducts with debris. Obstruction of the ducts and dilatation cause induration and sometimes

pain and will produce a lumpiness in the breast which is often very perceptible in patients about the menopause. At this stage there is a very narrow step between what might be called normal and abnormal involution of the breast. In the former, epithelial elements gradually degenerate and almost disappear and the structure of the mammary gland is largely replaced by

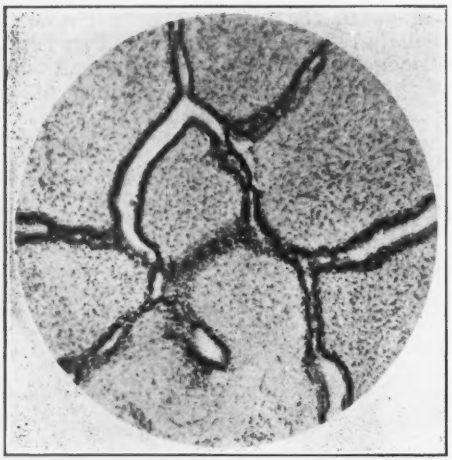

Fig. 2.—Photomicrograph of peri-ductal fibroma. Note the canal-like ducts and the clear peri-ductal connective tissue, which is rich in nuclei. X 110.

the deposition of fat. In what Warren terms "abnormal involution," however, a radically different process occurs and this may be divided into different types. The interstitial connective tissue becomes prominent. The epithelial elements sometimes seem to be stimulated and proliferate. The ducts may become plugged or compressed and cysts form. Whether we believe with Warren that this is abnormal involution, or with Bloodgood that it is probably the reaction to some inflammatory stimulus, or whether we think it is a new growth, it is well known that this process of abnormal involution or chronic cystic mastitis, as is termed by Billroth, is not infrequently a precursor of cancer.

The classification of benign mammary tumors, as has already been discussed, is difficult. Because of the intimate association of the peri-ductal connective tissue with the ducts there are always ducts or acini wherever there is a fibroma. Because of the changes in chronic cystic mastitis, which may assume a variety of forms and may resemble under the microscope fibro-cyst-adenoma, it is often difficult to classify this disease, and yet it appears to belong with benign tumors.

Bloodgood has called attention to what he calls the "blue dome cyst," which, when carefully cut down upon, presents the smooth contour of a thin-walled cyst with a blue color. When incised a thin clear fluid is evacuated and the blue color disappears. This type of cyst is undoubtedly a product of chronic cystic mastitis (abnormal involution). Examination of the breast tissue in its neighborhood will show a marked proliferation of epithelium in the ducts and acini. Not infrequently the epithelium is so abundant as to cause grave doubts whether the condition may not be malignant if emphasis is placed upon the appearance of a few of the ducts. However, such a solitary cyst is practically always benign even though the tissue in its neighborhood may from a histologic stand-

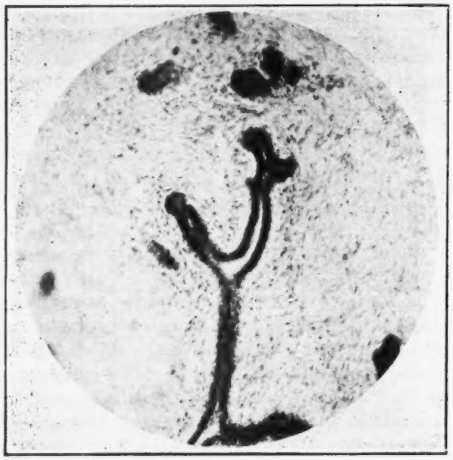

Fig. 3.—Photomicrograph of peri-ductal fibroma showing apparent terminals of some of the ducts and cross sections of some of them. X 130.

point be considered suggestive of cancer. Chronic cystic mastitis (abnormal involution) in which numerous small cysts are found scattered widely through the breast, is much more likely to be accompanied by, or be a predecessor of, cancer. This difference in malignant tendencies is difficult to explain. A large cyst seems to show

that the epithelial elements tend to maturity, whereas the epithelium where small cysts exist tends to form solid masses of epithelium or very small cysts, and seems to be more immature.

Galactocele occurs always during or after lactation. Abscesses of the breast from mastitis occur usually during or after lactation. Tuberculosis of the breast is uncommon, but is seen sufficiently often

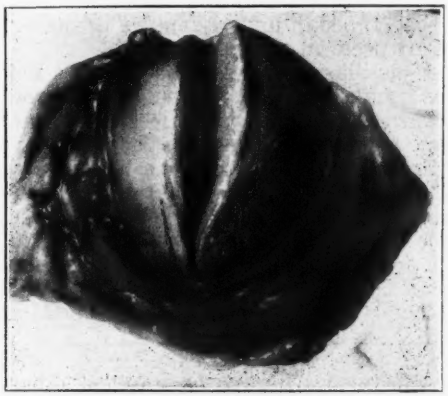

Fig. 4.—Drawing of incised fibro-cyst-adenoma. The growth was removed along with the surrounding mammary tissue, which has been stripped back showing the capsule.

to produce confusion in its early stages before it has broken down to form a cold abscess. Sometimes tuberculosis of the breast does not form abscesses. As Broders, of the Mayo Clinic, has shown, the dictum of Rokitansky that tuberculosis and cancer never exist together is incorrect; but it does seem to be true that in the breast they are seldom, if ever, associated. Galactocele and tuberculosis of the breast, which are rare, and abscesses of the breast, which are common, are not true tumors, but must be recognized in order to differentiate them from tumors.

Practically all benign tumors are well encapsulated. This is one of the most important methods of differentiating benign tumors from malignant growths. It is possible to have a malignant growth develop in an encapsulated benign tumor and extend through the capsule into the breast tissue. This occurrence must be borne in mind.

Aside from solitary blue dome cyst, which is but one of the features of chronic cystic mastitis, the other benign growths of the breast may be classified as: (1) peri-ductal fibroma, (2) peri-ductal myxoma, (3) fibro-cyst-adenoma, (4) papillary cyst-adenoma, and (5) chronic cystic mastitis. All of the benign tumors in this list of reported cases can be placed under these divisions.

The group of fibro-cyst-adenoma has a very wide range of histologic appearance, but the essential elements of the tumor—considerable connective tissue, some glands and ducts, many of them more or less dilated, and a capsule—are the same in all. It might be sub-divided into simple fibro-adenomas, in which the cysts are not apparent to the naked eye, and fibro-cyst-adenomas, in which the cysts can be seen with the naked eye. However, in all of

Fig. 5.—Drawing of incised surface of another large fibro-cyst-adenoma. Note the lobulated appearance in comparison with the peri-ductal fibroma.

these cases, the microscopic examination shows dilatation of the acini and consequently minute cyst formation. It seems simpler to classify them under one head.

The peri-ductal fibroma is very charac-

teristic in gross appearance. This tumor, like the fibro-cyst-adenoma, is always well encapsulated, and in any benign encapsulated tumor an incision into the capsule causes a retraction of the capsule and a bulging of the tumor into the incision; whereas, in an incision into a cancer,

Fig. 6.—Mammary gland from a man containing fibro-cyst-adenoma. Note the small cysts scattered through the well-encapsulated tumor.

which has no capsule and which tends to retract toward the center of the growth, the edges of the incision remain smooth with no bulging, just as if an incision had been made into a piece of cheese. The gross appearance of an incised peri-ductal fibroma is smooth and regular without lobulations. The capsule can be readily stripped off. An incised fibro-cyst-adenoma also bulges to some extent, but the gross appearance of the tumor, if it is a large growth, often shows a number of small cysts and the tumor tissue is divided into lobules and compartments, as is sometimes noticed in a large fibro-myoma of the uterus. The fibro-cyst-adenoma may become a very large growth and particularly in young women it may attain the size of the normal mammary gland. In such instances it appears to be practically outside the mammary gland proper and may develop behind, to the side, or to the front of the gland. The size of the tumor has no connection with malignant change in its tissue as cancer may develop in a small fibro-cyst-adenoma. A peri-ductal fibroma or myxoma is usually small, though it may assume a large size and take on a somewhat different histologic type. Here, when the tumor is large, the fibrous tissue becomes myxomatous, or it may become exceedingly cellular. A large peri-ductal fibroma or myxoma is very likely to undergo sarcomatous changes, and along with this growth should be removed the breast, the skin underlying the breast and major pectoral muscle.

A papillary cyst-adenoma contains fluid and a gungus or papillary material grows inward from its wall. In exploring any cyst the contents should be thoroughly examined. If the content of a solitary cyst of the breast is clear fluid the cyst is benign. If it is bloody or thick and muddy it is likely to be malignant. However, in the small cysts in chronic cystic mastitis small dark or bloody cysts with thin walls or small cysts containing thick material

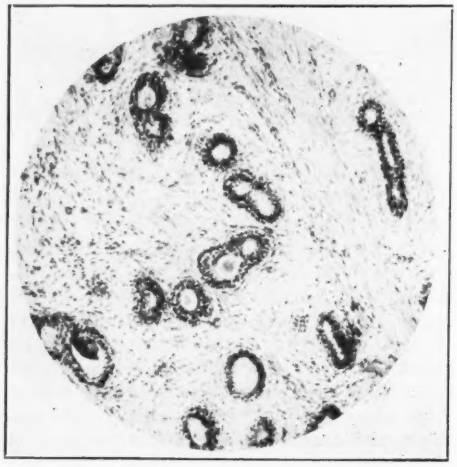

Fig. 7.—Photomicrograph of a fibro-cyst-adenoma showing fibrous tissue containing acini and ducts, some of which are considerably dilated. X 120.

are usually benign. It is in a large single cyst that the bloody or grumous contents are more significant of malignancy.

In benign mammary tumors the growth with the adjacent breast tissue should always be removed for matrices of other tumors often lie in the mammary tissue near a benign tumor. The breast is reconstructed by layers of sutures of plain cat-

gut and the skin carefully approximated. It is best to make the incision directly over the growth, particularly if there is doubt whether the growth may be cancerous.

The Warren operation of incising the breast along its lower margin, dissecting it from the pectoral fascia, and removing the tumor from beneath, should only be undertaken in growths that are quite plainly benign, and even in this type we are occasionally mistaken. In one instance

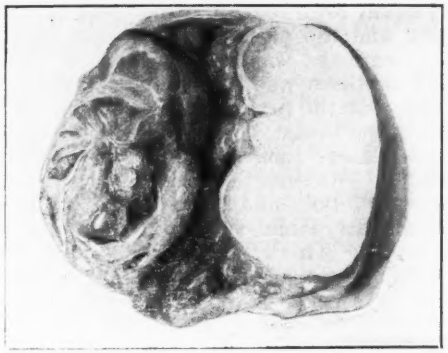

Fig. 8.—Drawing of well-encapsulated benign tumor of the breast, which shows the structure of papillary cyst-adenoma and fibro-cyst-adenoma with some myxomatous tissue in portions of the tumor. The tumor might be termed a papillary fibro-myxo-cyst-adenoma. As the papillary feature dominated, the tumor was classified as a papillary cyst-adenoma.

in which I did the Warren operation, incision of the growth showed it to be a small, deeply placed scirrhus. Radical operation was immediately done and there has since been no recurrence, but the Warren operation does not readily lend itself to the radical operation for cancer and the incision of a suspicious growth from beneath the breast after making a rather extensive dissection offers excellent opportunity for implantation of cancer cells into the wound if the tumor proves to be malignant.

REPORT OF CASES

This report comprises fifty-five cases of benign tumors of the breast that I have operated upon between October 23, 1908, and September 3, 1919, approximately eleven years. During this same period I have operated upon sixty-eight cases of cancer of the breast, so the benign tumors costitute about 45 % of the total mammary tumors. In four of these cases there are a written record and a history, but no microscopic section, so these four are not included in the general analysis. This leaves a group of fifty-one cases. The average age is thirty-three years. All of these cases were operated upon for the benign tumor and in all of them except three the operation for the benign tumor was the chief or the only surgical procedure. In one of these three patients operation was done for removal of a very large uterus from which the patient had been bleeding for sometime. There was a large, well encapsulated tumor of the breast. As she stood the hysterectomy well, the tumor of the breast was quickly removed. The

Fig. 9.—Photomicrograph of wall of a papillary cyst-adenoma. X 150.

patient died four days afterward. The death was due to the hysterectomy and the operation upon the breast apparently did not figure in the mortality. This was the only death in the series and can hardly be charged to the operation on the breast.

There were nine peri-ductal fibromas. The average age of these patients was thirty-two years, one patient was forty-seven years of age, and in one case the age was not recorded. All the other cases were under thirty years of age, so that if the patient who was forty-seven is excluded, the average age is twenty-four. This is in keeping with reports of other

surgeons, which show that the peri-ductal fibroma is a tumor that develops earlier than other benign tumors. This tumor originates from the peculiar fibrous tissue around the ducts, which, as Warren has pointed out, becomes prominent at the age of puberty and then takes an important part in the structure of the breasts. Consequently, it is apparent why growths from this tissue are more likely to occur at an early age. In one patient there was a distinct peri-ductal fibroma and also

Fig. 10.—Drawing of excised portion of mammary gland containing peri-ductal fibroma and chronic cystic mastitis with one rather large cyst.

chronic cystic mastitis with one rather large blue dome cyst and several smaller cysts. As the latter seemed the dominant pathologic condition, the case is classed under chronic cystic mastitis (abnormal involution).

There were nineteen cases of fibro-cyst-adenoma, the average age being thirty-two and one-half years. Two of the patients were men. Four were above forty years of age when operated upon.

There were sixteen cases of chronic cystic mastitis (abnormal involution), the average age being thirty-five and one-half years.

There were two cases of papillary cyst-adenoma, one being twenty-four years of age and the other fifty.

Of the two cases of simple or blue dome cyst of the breast, one was fifty-two years of age and the other forty-five years of age. In both of these cases there were in the breast tissues around the cyst such changes as are seen in chronic cystic mastitis without a large single cyst. This feature has already been discussed.

In one case, diagnosed as papillary cyst-adenoma, the microscopic section clearly showing this type of tumor, the growth returned two years later near the scar. It was then removed by another surgeon and again returned, this time with metastasis, and the patient died a year later. This patient was fifty years of age. Whether there was a small focus of malignancy at the first operation, which was deep in the breast, or whether a later cancerous change took place it is impossible to state. The growth that I removed was near the nipple and there was considerable discharge and some irritation about the nipple. This case is not classified.

Another patient who developed malignancy was thirty-seven years of age and

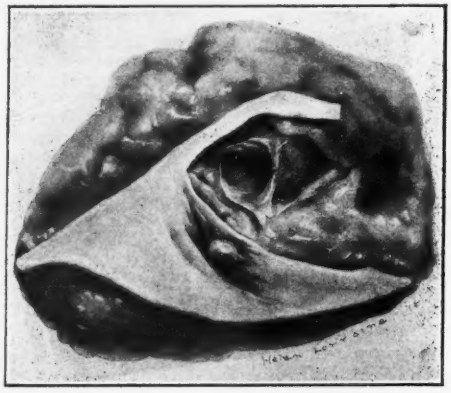

Fig. 11.—Drawing of excised mammary gland containing a single blue dome cyst. With a family history of cancer and an age of fifty-two, it was thought best to excise the mammary gland in this instance.

complained of pain and lumpiness in the outer and lower quadrant of the breast. This portion of the breast was removed by the Warren operation. A prompt recurrence took place within a few months, when a radical operation was done, but the patient died with metastasis in the mediastinum and liver a year after the operation.

At the first operation there was no encapsulated growth, but the portion of the breast removed presented the gross appearance of chronic cystic mastitis. Section taken from the parts of the specimen that seemed most suggestive of malignancy showed practically all the ducts and acini filled with undifferentiated epithelium, but there was no invasion of the tissues. However, recurrence showed typical invasion of cancer. I feel that in a similar case where the microscope shows over most of the section ducts and acini enlarged and filled with these so-called epithelial plugs, a radical operation for cancer is indicated.

Aside from these two patients that later developed cancer there were two recurrences of benign tumors. In one case after a peri-ductal fibroma had been removed a benign tumor formed in the same breast and proved to be a fibro-cyst-adenoma. This was removed and when the patient was last heard from about eighteen months later, there was no further recurrence. The other patient from whom a fibro-cyst-adenoma was removed was operated upon about three years later by another surgeon, who reported that there were a large cyst and several small cysts; so apparently this patient had chronic cystic mastitis after the primary removal of a single benign tumor.

However, there have been several patients from whom a portion of the breast was removed for chronic cystic mastitis (abnormal involution) who developed small lumps in the rest of the breast and sometimes in the other breast. These have not been marked or sufficient to justify further operation ,and sometimes these small lumps would disappear. Some of the small masses may have been due to the irritation of the buried sutures.

The only case in this series in which there is reasonable proof to believe that malignancy existed at the time of the first incomplete operation was the patient who was operated upon for chronic mastitis (abnormal involution).

In the patient who later developed malignancy following an operation for papillary cyst-adenoma near the nipple, there may have been a focus of malignancy deep in the breast, though this is a mere surmise. In no other case in which there was a definite well-circumscribed tumor has any suspicion of malignancy developed with removal of the tumor along with surrounding breast tissue.

DISCUSSION

Papers of Drs. Rodman and Horsley

Dr. Joseph C. Bloodgood, Baltimore, Md.—The thing that has impressed me most in my own experience with surgery of the breast is the very rapid change in type of the breast tumors that come under my observation. Up to about 1900 the benign tumors were about 34 per cent in my clinic at Johns Hopkins. Since then, in combining both the Johns Hopkins and my own service at St. Agnes Hospital, the percentage of benign has reached about 50 per cent, and in my own it is about 64 per cent.

Surely the women can not change the pathology of their tumors. The only explanation is that the time has grown shorter between the date when the woman realized that she had something in the breast and the time that she comes to the clinic. Perhaps this is due to the fact that Dr. Halsted and those associated with him have taught their patients the advisability of telling the doctor when they felt there was any breast lesion.

If 50 per cent of breast tumors are benign, you can see that if we can, without any risk of developing cancer, save these breasts, we are rewarding the women by curing them of the disease and avoiding mutilation. In these two clinics we have less than 2 per cent of such cases. We have a complete record of every woman from whom we have removed a portion of the breast and left that breast and the remaining breast, so we know the exact percentage of cancer in these cases. Of course we do not know the percentage of cancer in women at different developments of life, but as far as I can find out, the percentage of cancer in this large group of women in whom this operation was done is no greater than in women not entering the clinic.

Only one woman in that large group that we had operated upon returned with cancer in the breast and that woman, thanks to education, had the breast removed and is living today. So in the group of women that we have operated upon and saved the breast we have no mortality. Before this, our chief mortality in this group was automobile accidents. At the present time the greatest mortality is influenza.

The important thing is for the people to be educated as to whether they should be operated upon or not. That brings up another very important thing that has happened to me personally. When I first began to classify these records there were very few women with breast tumors who were not operated upon. Within the last three weeks I have written 250 letters to women I have seen personally and advised not to be operated upon and we know the result in that group. That is, if you go on information as to what a woman should consider a sign of some trouble in the breast, and the public and the doctor, you will largely increase the number of women who consult you for things for which their predecessors never consulted you.

In this group there are over 250 cases; that is, 250 of these 3,750 cases were never operated upon. The only mortality in that group is an automobile accident and some cases of influenza. They are not all five-year-old cases, but many of them are. Women will observe a pain in the breast. They will observe a discharge from the nipple. Women will now and then observe a pain or lump in the axilla; and women will observe a pulling in of the nipple. The first important thing is this: you will see many women who have felt a lump and who have consulted a physician and have been told they have a lump, but there is no lump. So the problem is what part of the breast that you can make out is of sufficient density to justify you in calling it a lump. I have the patient taken into the examining room and stripped so that both breasts can be observed, and she is told not to tell me—or whoever is to examine her—which breast is affected. I look at the breast, at the nipple, at the areola, and at the axilla, and see if there is any particular prominence. Then I begin and palpate the breast, first with one hand, then with two, and then make up my mind that there is a lump. Then very likely the examiner says: "Where was the lump you felt?" and the patient replies: "Here it is," in the other breast. When that is the sequence you want to be very suspicious of the lump she feels and the one you feel. We must be careful in distinguishing breasts that have lumps from those that have no lumps.

Dr. George W. Crile, Cleveland, Ohio.—Such papers as that to which we have just had the privilege of listening, with the following discussion, are of great value. I should much prefer to listen further to Dr. Bloodgood, but will take advantage of this opportunity to offer a few comments.

In a study of our first 1,000 operations on the breast we found that just 66 2/3 per cent were malignant and the rest benign. Of the proportion of malignant to benign tumors in our later cases, I can not give the exact figures, but I think they are about even in number. We have been much disappointed in the end results in certain types of patients. For instance, I can not recall any cure in a woman of the young florid and vigorous type. Nor can I recall a cure of any case when operated upon in the presence of lactation. As some one has said, the more nearly a patient resembles a smoked herring, the better the prognosis in cancer. Therefore, the appearance of the patient to some extent indicates the prognosis.

One or two practical points in the technic may be mentioned. Long ago the late John B. Murphy said he did not regard it as always necessary to remove the major pectoralis muscle. After careful consideration we discontinued the removal of the pectoralis major muscle in all cases in which the tumor is limited to the breast, does not go through the skin, and has not involved the axilla; but we make an extensive removal of the fascia in the region of the breast. In these cases we have not seen any recurrence. If there is an extensive tumor of course the extensive operation of Halstead is advisable; but we have not removed the muscle in at least half of our cases. We lay great stress upon the importance of very careful dissection in the axillary space with complete removal of the glands. As Dr. Bloodgood suggests, each tumor of the breast, whether benign or malignant, must be considered an individual problem. As our experience has increased, our dependence upon rules has decreased.

Dr. Rodman (closing).—I have such great respect for the two gentlemen who discussed the papers that I almost feel as if I should not say anything at all. However, there are one or two points that I wish to bring out. First of all, if a case is benign, then by all means save the breast if possible, but we must be perfectly sure that it is benign, and as we are not all such good pathologists as Dr. Bloodgood, I think we are perfectly safe to err rather on the side of doing too much than too little. I think if we remove the breast we should do it completely, because it adds nothing to the mortality and does not affect the future usefulness of the arm. I believe if we wait until the clinical diagnosis of carcinoma is possible we will not cure over 30 per cent of our cases. The only way to cure 72 per cent of three-year cases and 50 per cent of five-year cases is to operate before the diagnosis of carcinoma is possible. Of 100 cases of chronic interstitial or cystic mastitis, only one has died in our series. This 100 includes 23 cases that were microscopically malignant at the time of operation. I believe that the only way we can improve our breast statistics is to consider chronic interstitial mastitis as a serious condition, and those of us who have not the great experience of Dr. Crile and Dr. Boodgood back of us, have to have certain rules to go by.

In regard to the removal of the pectoralis major muscle, as brought out by Dr. Crile, we remove it because it exposes the axilla better and not because it is diseased. I do not believe one can do a complete axillary dissection without its removal.

Dr. Horsley (closing).—Just a word about the efficiency of the operation for cancer Dr. Rodman has shown. I have used it ever since it was demonstrated to me by his father, and I feel that by preserving the posterior thoracic nerve and the long subscapular there is very little functional disability, and it is really about as easy to remove the pectoral muscles as it is to preserve them. I have abandoned the Warren operation for benign tumors. I feel that if you are suspicious about the growth and it turns out to be cancer, if you incise the growth from underneath as in the Warren operation, you run a very great risk of implanting the cancer cells in the extensive dissection. I once thought a growth was a benign tumor and found it was a cancer. The Warren operation was used and I had some trouble in covering the wound after a radical. Since then I cut directly down upon the growth, carefully trying not to go into it. If it is malignant we can then easily do a radical operation; if it is benign, we can do whatever is necessary.

IMPORTANCE OF EARLY DIAGNOSIS IN CIRCULATORY DISTURBANCES OF THE EXTREMITIES

By Bertram M. Bernheim, M.D., F.A.C.S., Baltimore, Md.

There can be little question that irregularities of circulation in the extremities are much more common than the literature would lead one to believe, especially irregularities of a mild nature. Nor is the reason for this state of affairs especially obscure, since most people give little thought to slight pains in the legs and are rather prone to ascribe changes of color in the hands and feet to vagaries of the weather. And as for the doctor, neuritis covers a multitude of diagnostic omissions while aspirin relieves the suffering in a host of unimportant ills.

But this rather comfortable attitude is fraught with a certain amount of danger in that early detection of serious ills is rendered impossible and the institution of preventive measures is not even to be considered. For, in the few cases of beginning circulatory disturbances that have come to my attention it has been demonstrated quite conclusively that measures of a constructive or rehabilitative nature are usually successful in so far as they are put into effect early in the course of the condition. I do not mean that the disease process necessarily has been halted or even slowed up, though both the one and the other is quite possible in certain disorders, such as, for instance, a syphilitic endarteritis, the underlying condition having never received treatment. Indeed, I am quite convinced that the rapid development of nearly any vascular lesion can be hindered to a greater or lesser extent by proper measures instituted before it is too late. Our knowledge of this matter is necessarily of a rudimentary nature for the very good reason that early diagnosis having been the exception rather than the rule, attempts in this direction have not been made on any large scale.

We do have knowledge, though, concerning the case of a precarious blood supply and the development of an adequate collateral or compensatory circulation in both the arms and the legs. Our experience with aneurisms and all sorts of blood vessel disorders has borne fruit in this respect at least. The only trouble is that heretofore the conditions for which relief is sought have been recognized and have, therefore, come for treatment so late that only the most hurried and sketchy attempts at collateral development have been possible; and when these have failed, amputation has had to be done. For example, I have seen but few cases of thrombo-angeitis obliterans in which the main vascular channels have been unobstructed below the knees—and my experience in the condition has been rather extensive. If one stops to think of it a moment that is a very queer thing. It merely goes to show how little is known of the condition.

For example, the most likely thing to suppose is that thrombo-angeitis is a gradual occlusion of both veins and arteries. Indeed, this must be a gradual process. If it were a sudden affair, there would be such profound and dangerous circulatory disturbances that its early detection would be a matter of common occurrence. For argument's sake, then, it may be granted that the process is one of gradual development. But whether the occlusion takes place in veins and arteries concomitantly is a matter thus far unknown. However, ignorance of this subject is pardonable since changes in the smaller veins, especially the deep ones, are not always easy to detect. Even the great deep ones may go unsuspected in certain instances.

Of one thing I am firmly convinced, namely, that repeated and sustained inflammatory reactions may affect the veins of these patients in no uncertain way, while apparently not attacking the arteries at that time. One of my patients had a phlebitis involving the veins of his entire left lower leg some years ago. He was in bed several weeks, but gradually recovered. His right leg was in good shape till some four months ago, when, without warning, and from no demonstrable cause, it became the seat of a most extensive inflammation starting in the superficial veins and gradually affecting the deeper ones via the internal saphenous. A creeping thrombus formed in this vessel which gradually passed into the femo-

ral, from which point, if one may judge at all by symptoms, it involved the veins first in the right iliac fossa and the pelvis, then passed over to those in the left iliac region and so on into the left femoral. It was the most amazing exhibition I have ever seen. This patient was under the constant observation not only of myself, but of Dr. Samuel Wolman as well. He was in the hospital, ran a low grade temperature, had certain mild chilly sensations at times, pain, redness and swelling at the sites of the phlebitis, and in addition had the usual edema that follows femoral vein occlusion. Blood culture was negative; there was no sugar in his urine; his blood-urea was about normal; and his Wassermann was negative. He made a slow recovery, but of course wears rubber stockings on both legs. Arterial pulsation in the vessels of his feet is not to be made out, yet the feet are fairly warm and give rise to no pain, though the color of the toes at times is definitely cyanotically pale. The man, who is forty-four years of age and of Russian descent, has an adequate collateral circulation, and it is my opinion that so long as he guards this with care he will have no gangrene.

I have watched this patient for four years or more and have given it a great deal of thought, but can not make up my mind whether the trouble started first in the arteries or in the veins, or in both at the same time. That the disease is of an infectious origin of some form I have not a doubt. This man has been all over the world. He was an acrobat in a circus many years ago and worked his way through certain parts of Mexico and Africa, so that the underlying cause of his trouble may very well be some obscure parasitic infection. He denies luetic infection and his Wassermann, as noted, is negative. He is married and has a number of healthy children. But he does have that one habit so commonly found in cases of this sort—many others, too, of course—he is, and always has been, quite a heavy smoker. I wonder if this has any bearing upon the condition?

If it is impossible to say at the present time which set of vessels in thrombo-angeitis are involved first, I think the above mentioned case at least proves that its further development can make progress in the one set of vessels while apparently not affecting the other. It further illustrates the fact that an apparently adequate collateral circulation need not necessarily be disturbed while venous changes of a most profound character are taking place. Indeed, it is this latter fact that has influenced me to write this paper. We should try to diagnose these cases earlier, for it is quite possible to do much toward alleviation and rehabilitation.

In this connection I might say that not many months ago I saw in consultation with Dr. Maurice Chideckel one of the earliest cases of vascular disturbance of this nature that has come to my notice. A young Russian woman of about forty had had pain in her feet and lower legs, so much so as to incapacitate her to quite a considerable extent. There were no varicosities; she had had for some time a mild degree of flat foot, but corrective arch-supports had given relief. Her toes were usually somewhat dusky in color, but at times took on a suggestive pallor. They were rather cold at times. Arterial pulsation was definitely subnormal, but after a hot foot bath improved. The hands were all right. The Wassermann reaction was negative. Rest in bed, hot and cold baths, massage both by the hand and the electric vibrator, improved the condition immensely. The diagnosis is in doubt. I rather feel that it is a very early thrombo angeitis obliterans, though it may well be one of those mild cases of Raynaud's disease so frequently encountered. In either case, our future efforts must be along the lines of developing an adequate collateral circulation, against the possibility of grave changes in the main blood vessel channels.

Still another case came to my notice—also one of Dr. Chideckel's—a case of peculiar interest and instruction in that it is so different from the usual. A young girl of about seventeen complained that her feet were always cold, and upon examination they were found to be not only quite cold, but the skin had a cyanotic, mottled appearance. Pulsation in the arteries was normal and there was no venous abnormality. But there was a definite relaxation of the arches of the feet, the patient was stoop-shouldered, she had a bad color and an abdomen that was rather

more prominent than is usually seen in one of her years. She was chronically constipated, rather backward in school and altogether undeveloped. In other words, the symptoms referable to the vascular apparatus, while being rather prominent, seemed to be merely an incident, an affair dependent upon some underlying condition such as intestinal intoxication. I suggested an x-ray study of the abdominal contents and was not especially surprised to find a ptosis of the stomach and the large bowel of a most unusual grade This girl is now undergoing hospital treatment under a competent gastro-enterologist. She should have no further trouble with her feet if the intestinal condition can be corrected.

These three cases might be compared with profit to that of the old gentleman whom I saw in consultation with Dr. Katzoff, in June, 1918. He was obviously afflicted with thrombo-angeitis obliterans, had a sluggish ulcer on one of the small toes of the left foot, and was perfectly miserable from the pain. He had not slept for nights, was unable to eat, and looked very badly. Arterial pulsation was not to be felt. I gave him some general directions and requested that he see me again in two weeks. He did not present himself again for four months, at which time he came in with one toe of the left foot entirely gangrenous and the whole foot markdly edematous and dusky, the typical picture of beginning gangrene. His pain was excruciating. When chided for not coming to me as advised, his story was that the treatment outlined had gradually healed the ulcer and had relieved his pain to such an extent that he felt well enough to resume his work, which was that of an operator in a clothing factory. At the end of a month's work, though, his former trouble had recurred in worse degree than before.

What had happened was that under care and treatment a collateral circulation had developed of such proportions that an improvement took place. And it is quite possible that had this man been content to take care of himself this compensatory circulation might not only have been adequate; it might have improved to such extent that later on he could have gone to work with impunity. As it was he lost the leg.

But there is still another feature of this case worth recording. Arterial pulsation was absent in both feet from the very first time that I saw him, but there had never been the slightest pain or symptomatic circulatory disturbance of the right foot. There is not any now. At first thought this was rather unusual. It is quite customary to find one foot worse than the other, but it is also rather the rule to find a history of discomfort and coldness, a bit of cyanosis and perhaps some trouble around the nails first in one foot and then in the other. The explanation of the entire freedom from trouble of the one foot in this patient was found in a normal popliteal pulsation in the right leg, and an absence of it in the left leg. It will be interesting to follow this case.

It would seem, therefore, that physicians might well direct a little more attention to a study of circulatory changes in the extremities. If a patient complains of cold feet, pain in the feet, especially if the pain is sufficient to keep him awake at night, the state of the circulation ought to be investigated, instead of dismissing the subject with a snap diagnosis of neuritis. Neuritis it is, of course. There is most likely an inflammatory process going on in the nerves, but it is of the degenerative type and due to a lack of blood supply, an ischemia. It is an ischemic pain, a pain that is cumulative in its effect and one that is most difficult to relieve. Indeed, the pain is but the outward expression, the earliest perhaps, of blood vessel changes which become more and more profound as time goes, until finally there is a collapse from which recovery is not possible. Early diagnosis then means everything. The cases are far more common than one might think. And the amount of suffering that goes on and the number of amputations that are being done each year does little credit to us as professional men.

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THE OPERATIVE TREATMENT OF PELVIC INFLAMMATION*

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The observations in this paper are based on a series of over 500 cases. These cases are not tabulated, as this would add nothing to the value of the paper. No special originality is claimed for any of the views or procedures referred to. They are shared, I believe, by others of large experience. My special interest in the subject is due to the fact that I was among the first to oppose radical operation in acute cases and to make use of the Fowler, Ochsner-Murphy method in treatment, which was exactly opposite to the methods employed at that time. My first case was one in which I was unable to make a positive diagnosis between a late case of acute appendicitis and pelvic inflammation. Subsequent observation and operation proved it to be one of acute pelvic inflammation. The rapid improvement under the treatment referred to and the easy convalescence from the operation led me to adopt it in other cases with most satisfactory results. The other conclusions and technic were gradually evolved from experience and the views of others, but the principles of treatment and technic referred to in this paper have been those adopted some years ago and worked out in a large number of cases, and I believe solve many of the problems that arise in the consideration of the treatment of pelvic inflammation.

Pelvic inflammation is responsible for a large amount of pelvic pathology. While most other pelvic pathology of long standing will eventuate in a certain amount of tubal disease associated with it that will call for appropriate treatment, we are concerned in this paper only with those cases that are primarily inflammation. We do not refer either to tuberculous disease or secondary inflammation from some other source, as, for instance, appendicitis.

When we come to consider cases that are primarily due to inflammation, it will be found that they have their origin in two principal sources, gonorrhea on one hand and on the other infections incident to abortion or labor at term. These two types of infection are widely apart as to their relation to operative treatment. Gonorrhea may be regarded as a local inflammation with little tendency to absorption. While early operation is not to be advised as a routine procedure, as a matter of fact these cases can be operated at any stage with practically no risk to life and no necessity for drainage. The local nature of the infection is borne out by the fact that while it may be attended with a great deal of pain and disability, we do not often have a great rise in temperature, 100 to 101° being about the maximum. Neither do we have any marked acceleration of the pulse, and the leucocyte and differential count is not indicative of a severe form of infection. Notwithstanding this general rule, it is true, of course, that we do have absorption of the gonococcus into the blood at times and this is evidenced by endocarditis, joint infection, etc. But these cases are comparatively infrequent, certainly in the female, when the great number of cases of gonorrhea is taken into account.

On the other hand, those infections following abortion or labor at term present every evidence of systemic infection and absorption is, as a rule, the predominating picture and we are really dealing with a septicemia. This is noted by chills, high temperature, rapid pulse and a blood count indicating a severe form of infection. Sometimes the infection remains localized in the uterus and sometimes it extends beyond into the tubes and involves the peritoneoum or goes into the pelvic connective tissues. These infections may be due to a variety of organisms, and it is sometimes difficult to tell exactly which germs are concerned. They have, however, a more or less common symptomatology and may for practical purposes be grouped under one head. In any case the condition presented is a grave one. It is

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just in these cases that we are liable to do the wrong thing. The condition of the patient would appear to call for heroic treatment. If, however, an operation is undertaken at this stage, it will be found to be attended with a very high mortality which runs from 50 to 75 per cent. The reason for this is not far to seek. We are dealing with septicemia, due to absorption, and operation does two very bad things. It increases absorption by breaking down the walls of protection, and at the same time the resistance of the patient is lowered by prolonged and tedious operation under general anesthesia. What is indicated in these cases is not operation, but a method of treatment designed to diminish absorption and to increase the patient's resistance and particularly to allow time for the assembling of Nature's forces for the resistance of the infection. This is best accomplished by the line of treatment commonly used for peritonitis, and consists of absolute rest in bed in the elevated position, saline by rectum, ice bags over the abdomen, withdrawal of food and no purgation. The pelvis is particularly well situated to prevent spread of inflammation, and in ordinary cases and under proper management there is comparatively little danger of general peritonitis. It will surprise any one who has not seen it done to note how quickly in a majority of cases all of the symptoms will subside and the patient enter into a period of convalescence. The only indication for operation at this stage is the formation of an abscess, which can be evacuated by either vaginal puncture or a muscle splitting operation in either iliac fossa, should the abscess be pointing in this direction. By this method the mortality may be reduced from 50 per cent, the operative mortality, to about 2 per cent.

In addition to this it is undoubtedly true that under favorable conditions many of these cases of septic infection have a marked tendency to undergo resolution so that the entire inflammatory exudate may be absorbed. This may eventuate in a symptomatic cure in which the patient recovers her health, but the tubes are permanently closed by adhesions or occlusion, or in an absolute cure in which the patient recovers her health and the tubes function, as is evidenced by subsequent pregnancy.

These observations have a very important bearing on operative treatment because it may be said that while there are exceptions, as a rule, operations for pelvic inflammation do not belong to the life-saving class. There are safer and better ways of dealing with them than by operating and delay is an advantage. We are then able to perform deliberately such operations as will best promote the health and welfare of the patient.

A consideration of operative treatment implies a consideration of the disabilities from which we hope to relieve the patient; but only brief reference to these will be made. The amount of ill health, as a result of chronic pelvic inflammation, varies a great deal, possibly due to an extent, at any rate, to the susceptibility of the patient. We often find cases in which the pelvis is filled with exudate, but the patient appears to enjoy reasonably good health and very little pain or discomfort. On the other hand, many cases lead a life of invalidism or semi-invalidism. Pain and discomfort are almost invariably present, but vary a great deal. Often the patient is unable to take necessary exercise or attend to her household duties. Recurring attacks of pelvic inflammation are of frequent occurrence. These cases are those in which a focus of infection or one or more small abscesses are present which are temporarily overcome by body resistance, but become more or less active following exertion, menstruation or increased congestion from various causes; or where there are adhesions to the intestinal tract which reinfect from time to time. Painful menstruation is not present as often as would be supposed. Its degree has a direct relation to the ovaries in most cases. Where the ovaries are encapsulated in adhesions, particularly when they are firmly bound down to the pelvic wall, the pain is often excruciating. The reason for this is that when the normal congestion takes place at the time of menstruation the ovary can not expand owing to the dense wall of adhesions, and the effect is the same as if it were being violently squeezed. I have often been able to demonstrate the relation of this condition to violent pain at the menstrual

period. When the ovaries are so situated that they can not expand freely there is often no pain. The same condition is present to a lesser extent when the uterus is incarcerated and bound down by dense adhesions.

Metrorrhagia is frequently present irrespective of the condition of the endometrium and is due to increased congestion.

Chronic toxemia is almost invariably present, and although the patient may appear to be in reasonably good condition, there is almost always a marked improvement following removal of the foci of infection.

Dyspareunia is almost uniformly present and is doubtless the cause of much of the discomfort and annoyance of which the patient complains, although she may not refer to it.

No reference has been made to sterility because I doubt very much the practicability of attempting to restore the function of the tubes. Occasionally we read of successful cases, but they are very infrequent and most often our attempts will not only be unsuccessful, but another operation will become necessary. However, this is a case in which the wishes of the patient, as a rule, determine. In favorable cases and when the patient understands the probable failure and the possible necessity for another operation, it may be undertaken, but not as a routine. Ordinarily we will have to assume the position that the disease has caused the sterility and that in the operation we can only remove the disease. While the removal of the tubes is practically always advisable, it is seldom necessary to remove more. The object of conservative operation in the pelvis is to preserve menstruation. This means the preservation of the uterus and the ovaries. If either has to be sacrificed, it is better to make a clean sweep of the pelvis. Pelvic inflammation is usually found in young women and the preservation of the menstrual function is of vital importance to them. Notwithstanding that when the abdomen is opened we often find a mass in which the various organs at first can not be distinguished, a little patience in separating adhesions along their normal lines of cleavage will enable us to separate from the mass a more or less normal uterus, and while at first the ovaries may be completely hidden by the adherent and encircling tubes, when we have separated them the ovaries will be found to be very nearly normal. In other cases one or both ovaries may be involved in a tube-ovarian abscess or contain an abscess. If one ovary is sound it can be retained, or if both are involved both can be resected or the most favorable one resected and the other removed. It is surprising, however, how often we can peel out from its bed of adhesions a perfectly sound and normal ovary.

I have always found that separation of adherent tubes was best effected by commencing in the mid line on the posterior aspect of the uterus and vagina as low down as possible. From this point I work up and toward each side. In this way the adhesions seem to give with greater ease and we are able to effect separation with the minimum amount of tearing and trauma. A complete separation and isolation of each organ should be effected before any removal is practiced. We are thus able to examine all the structures and determine definitely what we are going to do. The following are the procedures that I have followed almost uniformly in operating. If the ovary is to be left, the ligature controlling the blood supply from the ovarian artery is placed between the ovary and the tube. Another ligature is placed with a needle to encircle the horn of the uterus and to include the uterine artery. The uterine portion of the tube is then excised by a V-shaped incision, and when the uterine artery is cut through, the ligature which has been placed is tightly tied, thus closing the aperture in the uterine wall and controlling the bleeding at the same time. The tube is then removed by incising the broad ligament close to the tube, always being on the lookout for a blood vessel that comes in about the center of the tube. The broad ligament is then repaired by suturing, bringing the infundibular border against the horn of the uterus. This at the same time brings the ovary up against the posterior aspect of the uterus, where it is not likely to become involved in adhesions or be pressed upon. Another procedure which I uniformly practice in all cases of pelvic inflammation is the temporary suspension of the uterus.

A very interesting paper on this subject was read before this Society by Dr. E. H. Ochsner, in 1908. He stated in his paper that he had been performing this operation for seven years. His experience had been the same as mine in that he had operated for cases of pelvic inflammation and found on subsequent examination that the uterus was densely adherent in a position of retrodisplacement. To overcome this very distressing sequela various methods have at times been advocated, even the complete removal of all of the pelvic organs. In view of the fact that such inflammations are not infrequently encountered in young women, such a procedure is, of course, undesirable, to say nothing of the added dangers of doing a more severe and exhausting operation on a patient already debilitated.

I had myself been making use of the same technic for some years previous to the time I heard his paper, and at the time the paper was read it was generally commended. However, although I have made no search of the literature, I can state that I do not recall having heard or read any reference to this procedure since. Whether this is because its use is so general that no one has thought it worth while to refer to it or whether no one but Dr. Ochsner and myself are doing it, I do not know. It might therefore be interesting to refer to the subject again. The procedure and the reasons for performing it are very simple and can be stated in a few words. In quite a large number of conditions in which operation is indicated, after the operation is completed we find lying behind the uterus denuded areas and areas of organized lymph or blood clots. The more common of them are old ectopic pregnancies and various degrees of pelvic inflammation. When we have an inflammation or any other pathologic condition of the tubes, they naturally drop in Douglas' cul de sac, where they become adherent, and in removing them we leave behind raw surfaces. If nothing is done to the uterus it drops back into relation with these raw surfaces and in a large percentage of cases will become densely adherent. This is a condition that is invariably pathologic. In order to prevent this it is necessary either to remove the uterus or to hold it fowrard out of contact with the denuded area. The various ligament operations are not so satisfactory because while they may hold the fundus forward they do not lift it out of contact. This, however, is readily accomplished by suspending the uterus to the anterior abdominal wall. If the uterus is retroflexed or markedly retrodisplaced, there is no real objection to making the suspension a permanent one by using kangaroo tendon or some other method of accomplishing this result. The removal of the tubes will, of course, prevent any further pregnancy, and therefore we will have none of the complications that result from suspension of the uterus followed by pregnancy. In many of the cases, however, there is no retrodisplacement of the uterus, and it is only necessary to hold the uterus up for a comparatively short time until the raw surfaces have healed over. This is done by making the suspension with plain or iodized catgut. The healing over of the raw surfaces takes place quickly and also the absorption of the catgut, and in clinical experience I have found in subsequent examinations that the uterus has dropped away from the abdominal wall, is in normal position and freely movable and that the patient is suffering from no pevic discomfort or other evidence of pelvic pathology. I do not think that any elaborate technic is necessary, and as far as complications are concerned I do not recall ever having encountered any. The procedure is a simple one, but I believe it makes the difference between success and failure in securing results from operations for pelvic inflammation.

If pus is found outside of the tubes, or if there is oozing which can not be satisfactorily controlled, drainage may be practiced, but, as a rule, it is not necessary. When done, a glass tube is used and the curved end placed in the bottom of the cul de sac and in this is inserted one or two strands of gauze. The tube is tied in the wound with the free ends of a suture and the wound otherwise closed. The gauze is removed from time to time as is indicated and drains away the fluid as it accumulates. As a rule, it is only necessary for the tube to remain in position for a few days.

CONCLUSIONS

1. Pelvic inflammation is most frequently due to one of two causes: gonorrhea or infections following abortion or labor at term.

2. These two types differ widely as to methods of treatment. Gonorrheal cases are, as a rule, local in their effect and are not attended by symptoms of absorption. Infections following abortion or labor at term, on the other hand, always manifest symptoms of intense absorption and are of the nature of a septicemia.

3. Operation on gonorrheal cases may be performed with comparative safety at any stage, but radical operations on the septicemia group in the acute stage are attended by a high mortality and should not be done.

4. Delay in operation on the septicemic group is an advantage, is less dangerous and often results in symptomatic or absolute cure.

5. The best method of treatment is that usually known as the Fowler, Ochsner-Murphy treatment.

6. The cases in which operation is indicated are those which have passed into the chronic stage. Gonorrhea may be considered as operable at any stage, but a moderate delay is permissable.

7. In operation it is seldom practicable to restore the function of the tubes. They really become the foci of infection, their removal stops the toxic process, and if they are left further trouble is liable to manifest itself.

8. The objects of the operation are to remove the tubes and preserve the essential organs of menstruation, the uterus and the ovaries.

9. The details of operation on which emphasis is laid are the complete removal by excising also the uterine portion of the tube, the attachment of the broad ligament to the horn of the uterus, which elevates the ovary away from pressure and adhesions, and temporary suspension of the uterus.

EYE, EAR, NOSE AND THROAT

LOCAL ANESTHESIA IN ENUCLEATION AND ITS MODIFICATIONS; A SECOND OCCULAR SYNDROME WITH CONTRACTED FIELD, OF DENTAL ORIGIN; SPASMODIC TIC; GASSERIAN GANGLION INJECTIONS; CASE REPORTS*

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Prior to June 1, 1919, I had neither attempted nor witnessed enucleation under local anesthesia and was utterly astonished at the simplicity of the entire procedure. The anesthetic used was a 2% solution procain in 1 to 10,000 solution of adrenalin. Preliminary to the injection of this a 4% solution of cocain was dropped into the eye. The first injections were sub-conjunctival, then after five minutes' wait a 5 cm. needle was passed into the apex of the orbit four times, near the insertion of the four recti muscles, 1 c. c. of the solution being injected with each insertion. After another five minutes' wait a painless and practically bloodless operation was done with perfect ease and composure on the part of both patient and operator.

Case 1.—This was an elderly gentleman with advanced arterial sclerosis with the usual concomitants of kidney and heart lesions, positively contraindicating a general anesthetic. A simple enucleation was done and while the operation itself was practically bloodless, there was a profuse post-operative hemorrhage, as would be expected in arterial sclerosis.

Case 2.—Upon a normal healthy young woman a "Mules" operation was done with a perfect result and no operative or post-operative hemorrhage.

Case 3.—The third case was a healthy young man upon whom enucleation and glass ball implantation were done. There was no complication nor post-operative hemorrhage.

Case 4.—This was a middle-aged man with prostatic and other disorders of the genito-urinary tract, the urine showing both blood and pus. Enucleation with glass ball implantation was done with a perfectly satisfactory result, no post-operative complications at all.

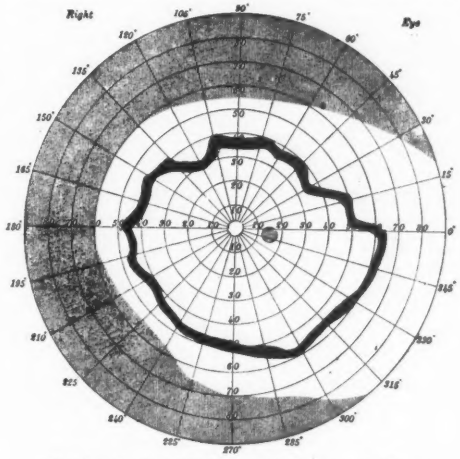
*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Thirteenth Annual Meeting, Asheville, N. C., Nov. 10-13, 1919.

My experience with these four cases has been so highly gratifying that I shall in the future follow it as a routine practice. Of course, there are exceptional cases where a general anesthetic is necessary on account of a painful local condition which would not permit the deep injections. This applies especially to children and to highly nervous adults.

A SECOND OCCULAR SYNDROME WITH CONTRACTED FIELD, OF DENTAL ORIGIN

I reported last year a single case under the title of "A Curious Ocular Syndrome of Dental Origin,"[1] which was new in my experience and which I had not seen described in any of the literature at my disposal.

On August 25 of this year a similar case showed up. A young man, cashier in one of the banks in a neighboring town (this syndrome seems peculiar to bankers) complained of floating bodies and a tired feeling in both eyes. The left eye was normal in every respect excepting central vision, which was 20/30. The right eye



Contracted field in mild toxic uveitis.

also appeared normal to physical examination, but the field was distinctly contracted as shown on this chart and with a plus 10 lens; numerous floating opacities were visible in the anterior segment of the vitreous; and central vision was 20/30. There was a bilateral hyperopia of one-half dioptre. The patient was referred to a local dental surgeon, who is also a roentgenologist. He reported two dead teeth with apical abscesses in the upper jaw on the left side. The patient was advised to have the dental lesions corrected

and report back at weekly intervals. Unfortunately I have neither seen nor heard from him since. My only reason for presenting this incomplete case report is to emphasize the importance of taking the field in all inflammatory disorders affecting the uveal tract.

SPASMODIC TIC

This distressing disorder, often referred to the ophthalmologist, is a very common one, but as it is only troublesome, not very painful, and does not materially interfere with physical well being, it is many times left untreated. In my opinion, the most satisfactory treatment is the stretching or dividing of the trunk of the seventh nerve through an incision between the anterior margin of the mastoid tip and the parotid gland. In the past twelve months I have so treated two cases.

The first, a middle-aged woman referred by Dr. Kirkpatrick, of Selma, Ala., was of long standing and the trouble involved every muscle supplied by the seventh nerve on the right side from the orbicularis to the platysma. October 17, 1918, under general anesthesia, the nerve trunk was exposed and caught up with a strabismus hook. By sliding this hook back and forth with a strong pull, the nerve was stretched until the index finger could be passed under it. It was then stretched almost to the point of breaking, the tension being equally distributed so far as possible between the proximal and distal portions. The nerve was allowed to drop back into the wound in a coil about 2 cm. in diameter. The wound was closed with primary union without incident. The immediate result was a complete relief from the facial spasm with paralysis on the right side which lasted about four weeks, the function of the nerve being gradually restored from above downward. The relief from the spasm lasted eight months, the patient returning for a second operation July 9, 1919, with a well-defined spasmodic tic, nearly as bad as before. The same procedure was attempted, but the nerve trunk could not be isolated, so I simply passed a knife along the anterior margin of the mastoid tip cutting squarely through the nerve. The immediate result was apparently identical with that of the former operation.

Dr. Kirkpatrick reports on November 5, seventeen weeks after the operation, that the facial paralysis is still evident, but slowly improving. The second case is reported in case number five of my last series of ganglion injection.

GASSERIAN GANGLION INJECTIONS

In June, 1918, the essayist presented before the Section on Laryngology and Otology of the American Medical Association a second paper on this subject with case reports.[2] All cases reported at that time as permanently relieved have remained so up to the present time. Since that report, injection for tic douloureux of the so-called "essential" type has been done six times, with highly gratifying results in five of them, and a most deplorable failure in the sixth.

Case 1.—This was a railroad construction engineer with the usual history of painful tic limited to the mandibular division on the right side. The injection was done April 9, of this year, under general anesthesia, with no complications or sequelae, and with immediate relief from pain which has continued to the present time.

Case 2.—An elderly man was referred by Dr. Maxwell, of Omaha, Neb. The entire distribution of the right trigeminal was involved and his face had been outrageously mutilated by some ill-advised surgical attempts at relief. The injection was accomplished May 28, of this year, under general anesthesia without difficulty despite the deformity of the face which obscured the landmarks. The relief was instantaneous and complete and continues up to the present time. Unfortunately this patient developed a corneal ulcer due largely to the fact that the surgical attempt to relieve his neuralgia had caused an ectropion of the lower lid with epiphora and a chronic purulent conjunctivitis. The ulcer healed in time without serious injury to the eye.

Case 3.—The third case, referred by Dr. O'Farrell, of Richmond, Tex., was one of long-standing disorder affecting the second and third divisions of the fifth nerve on the right side only. The injection was accomplished June 25, under general anesthesia, with immediate and apparently permanent relief. No complications or sequelae.

Case 4.—Dr. A. J. Mooney, of Statesboro, Ga., referred a case of long standing affecting both sides, involving the second and third divisions. On the left side, a surgical attack had been made on the second branch without permanent relief and incidentally without deformity. Nerve trunk injections had been tried and a surgical attack had been made on the right side through the mental foramen. The patient was 55 years old, very frail, and plainly showed the ravages of many years' intense suffering. In addition to the painful tic on both sides he had a spasmodic tic on the left side as a result of an injury to the facial nerve during one of the previous operations. This patient had a mitral systolic "blow" with the most peculiar heart action I have ever seen. It would beat along quite regularly at a normal rate for a time, suddenly break up into a rapid irregular action lasting quite a while, and then, after a pause, would recover and resume an approximately normal rhythm. This appeared to be habitual with him; and in view of the fact that he had taken ether four or five times before, it was decided to inject one side (the right, as it was the more painful) under general anesthesia and the other under local anesthesia after he had recovered some strength and vitality. The injection was done September 29, this year, and fortunately the needle entered at the first insertion and the injection proper occupied only three minutes. But his heart behaved so very badly during the administration of the anesthetic that we were much alarmed. In addition to the unfavorable heart action he also developed a very troublesome respiratory arhythmia which closely resembled the

type described as Biots' respiration; that is, a periodic pause in respiration lasting from one-half minute to a minute with spontaneous resumption. He became alarmingly cyanotic several times, but after being returned to his room made a quick recovery from the effects of the anesthetic, had immediate and apparently permanent relief from pain, with no complications or sequelae and was discharged on the seventh day with instructions to return in from four to six weeks for injection of the left ganglion.

Case 5.—A case of painful tic and spasmodic tic, both on the right side, of long standing, was referred by Dr. Mathews, of Quitman, Ga. The painful tic involved the second and third divisions of the fifth nerve and the spasmodic tic involved the entire distribution of the seventh. On September 30, the right gasserian ganglion was injected under general anesthesia without incident, complication or sequelae. The relief from pain was complete and apparently permanent. On October 7, the right facial nerve was exposed between the mastoid tip and the parotid gland and thoroughly stretched as described in Dr. Kirkpatrick's patient, the immediate result being a complete arrest of the spasmodic condition and of function as well, giving the classic picture of facial paralysis. Owing to the fact that the right eye now remained open and still had anesthesia of the cornea, the protective dressing which had been left on the fifth day after the injection was replaced for five days and as nothing happened in that time it was again left off, but on the seventh day a slight epithelial abrasion appeared on the cornea which promptly disappeared in two days after the protective dressing was resumed. This patient returned to her home on the fourteenth day after the stretching of the seventh nerve and the twenty-second day after the ganglion injection, entirely relieved of both pain and twitching with a very perceptible decrease in the expression of facial paralysis and with ability to close the eye.

The case reported in this paper as number four returned October 28 for injection on the left side; and while he was a little nervous and complained of cold hands and feet, he appeared to me to be in a much better physical and mental condition than on the previous occasion. In the light of our former experience I tried to persuade him to have the injection done under local anesthesia, but he preferred the general anesthesia and this was agreed to. The anesthetist, before beginning the administration of ether preceded by ethyl chlorid, called my attention to the marked eccentricity and arhythemia of the heart's action, but this did not seem to me any worse than it was on the former occasion and I directed him to proceeed. The same phenomenon of breathing described in the report of the former operation manifested itself throughout the entire procedure, but was at no time any more alarming than before and the only untoward incident of the operation was one which I had not experienced before, but which has been reported by other surgeons, namely, when the needle point had passed through the corpus of the ganglion and was supposedly just within the dura, I removed the obturator expecting a gentle welling up of cerebro-spinal fluid. Instead there was a very free flow of bright arterial blood; the needle showing at this time a penetration of 7.5 cm. I immediately withdrew the needle and had it cleaned and boiled. It was then reinserted at a slightly different angle with precisely the same result. I very promptly withdrew the needle and reinserted it at a different angle without attempting to advance the point further than the corpus of the ganglion. When the obturator was removed the needle remained perfectly dry, showing a penetration of 7 cm. I waited quite a while before making the injection, but nothing showed in the needle, so the injection was completed in the usual way and the patient was returned to his room. Two hours later he seemed to be recovering from the effects of the anesthetic, but was a little dopey. However, no significance was attached to this, as he had had a full dose of morphia. The peculiar breathing was still in evidence and the arhythmia of the heart as well, with a pulse so feeble that most of the time it could not be felt at all and would not respond to stimulation in any form. This continued through the evening, though the patient could be aroused and could even get out of bed without assistance. By midnight his condition became so alarming that consultation was called, but no definite conclusion was reached. At this time the temperature was 105°; respiration had assumed the Cheyne-Stokes type; and the pulse was so feeble that it could not be counted. The right pupil reacted normally, the left being dilated by atropin. The patient was incoherent, but not entirely unconscious. At 9 o'clock the next morning he was very much improved; temperature 101°, conscious when spoken to, could talk coherently and could swallow fluids. (I neglected to mention that during the preceding night and afternoon he had had a partial paralysis of the muscles of deglutition.) Later in the day he lapsed into unconsciousness with muttering delirium, was extremely restless, with muscular twitchings on both sides, but more marked on the right. At 2 p. m. decompression was done without beneficial result. In fact, the intracranial pressure was found to be subnormal. The patient died at 7 p. m., twenty-nine hours after operation.

As to what happened in this operation, there are three hypotheses. First, a hemorrhage at the base; second, an embolus; and third, a percolation of alcohol backward into the neighborhood of the medulla. Of these, the second is the most logical one. The first would have caused increased intracranial pressure, while the percolation of an extradural injection of alcohol into the neighborhood of any of the vital centers is inconceivable. There can be no question that the point of the needle entered a meningeal or a cerebral artery at the first insertion and I assume that at the second insertion the same artery was entered again and as there had been a sufficient interval for clot formation, an embolus could have been dislodged and started on its way by the second en-

trance of the needle into the artery. This deplorable accident has in no way modified my opinion that injection of the gasserian ganglion and its sensory root as described in my paper of June, 1918,[2] is the treatment *par excellence* for tic douloureux, its only rival being a surgical division of the sensory root; and I shall continue so to treat all cases referred to me.

After completing this paper the following report on a case injected in January, 1918, was received from Dr. Hilliard Wood, who was to open the discussion of this paper, but was not able to attend this meeting:

"Since the time you injected the right ganglion, the patient has never had another pain on that side of her face. The corneal ulcer which followed was mild in degree, but long-drawn-out, lasting for some six or eight weeks, but finally healed under atropin and bandage, leaving practically no visible scar in the cornea. There is still perfect anesthesia of all parts of the right side of the head and face supplied by the right fifth nerve. From this anesthesia, however, the patient suffers no inconvenience, and is very happy over her relief.

"However, some two months ago the patient developed a mild form of tic on the left side of her face and head, about which she wrote you some three or four weeks ago. I have not seen her personally during this time, but have talked to her over the telephone and my impression is that these attacks on the left side are not so severe as they were on the right side previous to your treatment. The patient is otherwise in excellent health and very grateful to you, as we all are, for the successful injection. I deem the success of the injection by you more significant in view of the fact that the patient had for years been the rounds and had submitted to pretty much every other line of treatment for relief with no permanent result."

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DISCUSSION

Dr. Eldred B. Cayce, Nashville, Tenn.—I saw the patient in consultation with Dr. Wood and the results are all we could expect. I have not seen her since she had this pain on the opposite side. Every time I saw her she was very happy and grateful. In regard to the enucleation of eyes under local anesthesia, after the fifth operation I felt that I learned the proper way of enucleating an eye. I often noted in reading literature in reporting cases that they said that as a general anesthesia was contraindicated the eye was enucleated under local. I wondered why they did not enucleate all under local. In the sixth case the results were not so happy. I used very much the same technic as Dr. Martin suggested and used. In some way some of the solution must have gotten into the fatty tissue of the orbit and we had a cellulitis. It cleared up and the patient recovered, but the orbit is not in any shape for an artificial eye.

I now only use local anesthesia when a general anesthesia is contraindicated.

Dr. H. H. Briggs, Asheville, N. C.—I wish to report briefly a case which I treated four years ago, a man about sixty years of age, who had an intolerable tic involving the second and third divisions of the fifth of the right side. All the teeth from the bicuspids back, above and below, had been removed, as is usually found in such cases. They go to the dentist from time to time, and have their teeth out one by one, without relief. In this case the attacks were so frequent and intense that he had resorted to anodynes of various kinds. After eliminating by the x-ray the possibility of a local source of irritation or infection, a resection of the second and third divisions of the fifth was done under ether anesthesia. The second division was attacked through the buccal cavity, the tissues of the cheek dissected up, and the filaments of the nerve found and dissected out as far as possible into the cheek. The nerve was then followed up through the infraorbital notch and along the floor of the orbit to a point opposite the equator of the eye, where it was severed, resecting about 1½ inches of nerve and filaments all told. The third division was found at its exit at the mental foramen, and the filaments severed as far as possible in the soft tissues of the cheek. The nerve was again exposed in the pharynx at its entrance into the mandibular foramen, dissected an inch farther up, and severed. An electrically driven burr of 4 mm. diameter was then driven from the mental foramen through the nerve canal to a point near to the mandibular foramen, the entire nerve being destroyed for a distance of more than three inches. For three years the patient had no return of the symptoms, when slight evidences of nerve regeneration were manifested by the return of pain, which grew worse, especially in the third division. There being nothing left to do except injection of the nerve farther back, this was done at its exit at the foramen ovale six months ago. Some of the alcohol solution must have penetrated into the gasserian ganglion, as there was immediate numbness over the branches not only of the second and third divisions, but also of the ophthalmic division, since which time there has been no return of pain.

Dr. Martin (closing).—My paper covered case reports only. I did not attempt a detailed description of the operations; that has been done in former papers. Dr. Cayce mentions some untoward complications during local anesthesia for enucleation and its modifications; my experience is limited to the four cases reported in this paper and I am so well pleased that I shall in the future use local in preference to general anesthesia in these operations.

I am disappointed in not hearing any discussion of the operations for spasmodic tic. This is a very common disorder and a very troublesome one. It seems to me that the nerve-stretching operation is a very practical and useful one and

if that should fail the nerve can always be divided.

There can be no question that under certain conditions both motor and sensory nerves regenerate after division. However, unfortunately, when function is restored the tic returns. If the nerve trunk is not covered by scar tissue the stretching can be repeated again and again. In each of my cases the classic picture of facial paralysis seemed identical whether the nerve was divided or stretched.

I was also disappointed that no one discussed the cases showing optic nerve involvement in the two cases of mild toxic uveitis. The promptness and thoroughness of the restoration of optic nerve function after eradication of the focus of infection were truly startling. Now as to the gasserian ganglion injections: I made no attempt in this paper to describe the technic, as this has been done in former papers, but it is a little discouraging to have three such prominent men as Dr. Briggs, Dr. Patton and Dr. Stucky fail to discriminate between the procedure advocated and practiced by the speaker and the various methods of nerve trunk injections and more or less accidental percolation of the fluid into the ganglion which I have deprecated in every paper I have contributed on this subject.

The procedure described by Dr. Patton as "Smith's" is fundamentally wrong, as the needle approaches the foramen at a right angle to the plane of its circumference instead of a perpendicular; a temporary anesthesia can be secured by this method or by simply injecting an anesthetic into the spheno-maxillary fossa from any angle, but for permanent relief from tic douloureux the injected fluid must reach not only the corpus of the ganglion, but the sensory root as well. In the method followed by the speaker no measurements are required whatever; only a thorough knowledge of the topography of the region involved and a lot of practice on the cadaver. You have a needle ten cm. long. It is introduced just external to and above the corner of the mouth, passing into the spheno-maxillary fossa between the ramus of the lower jaw and the alveolar process of the uper jaw closely grazing the latter. The needle has an obturator which serves a double purpose; it prevents clogging of the lumen of the needle and lessens the danger of injury to neighboring blood vessels. The needle is passed to a depth of 6 cm. without stopping; then you must pause and exercise the greatest care and caution from that point on; for at that depth your needle point is in the immediate neighborhood of the foramen ovale. Following this method the needle approaches the foramen in a direction perpendicular to the plane of its greatest diameter and after sufficient practice you will find to your very great satisfaction that the needle will often pass directly into the foramen without touching the bone at all. But if the needle point is against the bone and shows a penetration greater than 6 cm. it is below the foramen! if less than 6 cm., it is above. Usually by gentle manipulation the point can be guided into the foramen; if not, the needle must be withdrawn and reinserted at a somewhat different angle.

UNUSUAL CASES TAKEN FROM THE RECORDS*

By Thos. McDavitt, M.D.,
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Once in a while it is interesting to survey the record of work done and enter into detail of interesting cases, even though a thorough scientific discussion is not attempted, nor the pathological conditions fully considered. Food for reflection even in a scientific body may be occasioned by a short detail of daily experiences, especially if the conditions are difficult of explanation, or the results of these conditions are not those anticipated from the symptoms, or according to the usual findings. Frequently the pathological condition is difficult to locate. Again, the condition seems clear and apparent, but the physical results are not according to the rules laid down for this change from the normal. The history of a case often gives a clue to expected findings. Frequently we prejudice the diagnosis from the clinical history. It is often difficult to dislodge a preconceived diagnosis after a full examination has been made. Conversely it is frequently difficult to make pathological findings tally with the history as detailed by the patient.

The subjective symptoms and objective findings demonstrate a wide variance from the usual results expected from the combined effects of these symptoms.

I shall detail rather meagerly a few unusual cases seen in the routine of daily practice.

Case 1.—H. J., a man, age 35, of athletic build, had a history of perfect health. No previous illness and no injury accounted for a change in his normal condition. His vision had always been perfect. There was no refractive error, no inflammation about or in the eyes, and no headaches nor discomfort about the head.

Some time in January or February of 1919 he noticed a dimming of the vision, of seemingly equal amount in each eye. It increased gradually with no other accompanying symptoms until the darkness became absolute in April or May.

When led into my office, he presented the pitiable spectacle of an absolutely helpless blind athlete. The eyes were perfect outwardly, but

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examination showed not even light perception; the pupils dilated and contracted partially; the ophthalmoscope showed a double choked disc; a plus-six to eight lens was needed to outline the seeming flaming disc. At no time had any of Fuchs' triad of symptoms of papilitis,—vertigo, sick stomach and headache,—appeared. There had been no irregularity of gait, nor any loss of consciousness; no spasms; none of the usual symptoms of a brain tumor; pulse was 70 to 74; no history of lowering of the pulse beat indicative of brain pressure. Laboratory examination of the urine and of other examinations, including a Wassermann several times, were negative. An x-ray of the head was also negative. I examined him again in September with identical results of the former examination. There had been no physical deterioration nor any evidence of brain pressure. I shall not enter into a discussion of the portion of the brain of the supposed pressure, as that is beyond the scope or intention of this paper.

Case 2.—A bullet entered above and slightly to the rear of the left mastoid. Evidently it was fired from the rear, as it ploughed its way to the front deep enough to make a scar to the outer angle of the left brow, and it gouged out the skull bone the whole length, probably three or four inches. The depth of the injury to the brain tissue could only be surmised by results. Underneath the outer scar tissue the whole surface was soft and there was no evidence of any bony formation. The right side of the body had been paralyzed, but at the time of examination the power of the leg had returned and the arm could be used with much loss of strength and little or no hand grip. The vision of each eye was 20/30 looking directly in front. The mentality of the man was reported as much changed from normal. He was childish in his attitude and seemed deficient in mental grasp. Objects held to the right of each eye could not be seen until brought to the central line. There was not even light perception on that side. He did not remember having had any sight in this side of the field since receiving the wound. The far-reaching consequences of what seemed externally not a deep brain wound was the interesting feature of this case and could be dilated on much beyond the limits of the paper.

Case 3.—L. H. said he had no subjective symptoms until within the last year or eighteen months. One would notice at once the peculiar thick glasses he wore, which on examination proved to be plus-six on a prism eight degree base out. He complained of no headache, no disturbance of great degree. His vision without glasses was 20/60. With the correction he was wearing, 20/40. Measurement proved a homonomous diplopia of thirty-five to forty degrees and a hypermetropia of ten dioptres. He complained of no double vision. There was no noticeable strabismus. The interesting feature was not only the high degree of muscular trouble, but the small amount of accompanying nerve disturbance.

Case 4.—A bullet had entered the lower border of the right orbit of F. L. from the front, destroying the eye-ball, which had been enucleated in France. It had torn away the lower border of the orbit and pursued its way directly backward with no wound of exit. There was no evidence of trouble except the loss of the right eyeball. Otherwise he was a perfect physical specimen. X-ray demonstrated the bullet lodged and encysted in the vicinity of the second cervical vertebra. It was giving no pain nor evidence of its existence except that it troubled his mind to know it was there. He was anxious to have it removed, but was advised not to interfere with it unless symptoms demanded it. From the point of entrance to the position of the final deposit of the bullet it is almost beyond belief that such a wound should not be fatal. The bullet undoubtedly passed entirely underneath the base of the skull, which seems almost impossible.

Case 5.—Carl M., a soldier, had gone over the top of the trenches and was lying on the ground when a shell exploded some twenty to forty yards to one side. He was picked up some time afterward, partially conscious but with no external wound whatever. It was discovered that the eye on the side of the explosion was blind. I examined him some months after the injury. There was no external evidence of any injury whatever. The vision of the other eye was 20/20. There was a reflex in the injured eye, but no clear image of the background. By indirect ophthalmoscopic examination, numerous small ruptures in the choroid could be demonstrated, evidently caused by the concussion of the shell. He claimed as good vision in this eye as in the other on entering service. In conversation with an oculist who had seen numerous eye injuries in one of the base hospitals, he stated he had seen a number of similar cases of ruptured choroids from explosive shells always on the side nearest the exploded shell, and never but one eye affected.

Case 6.—W. W. had lost vision in the left eye. He had a tooth pulled and immediately the eyesight on that side was dimmed and finally lost. Naturally he connected the two. I examined him some months afterward. There had also been some loss of acuity of vision in the other eye. Examination gave no light perception in the eye. There was reflex and the background could be examined. The lower half of the retina gave the peculiar evidence of having been detached at some time, although it had been reattached, but was not functioning at all. There had been a slight detachment peripherally in the other eye, but not sufficient to disturb the vision. The interesting feature here was the coincidence of the tooth pulling and the detachment. From the temper displayed by the patient, in civil life the dentist would have been held liable.

539 *Lowry Bldg.*

DISCUSSION

Dr. J. W. Jervey, Greenville, S. C.—I am particularly interested in the first case that Dr. McDavitt mentioned. Both eyes of this patient were found to be in a condition of choked disc. Our text-books and, I think, nearly all of our writers on the subject fail to bring out clearly a proper definition and differentiation of choked

disc, optic neuritis and embolism of the central artery. I believe there are distinctions to be made between these conditions of varying degrees of importance. One such condition may appear from one cause and one from another and some from no causes whatsoever that can be attributed. Sir Victor Horsley had a great deal of experience in these cases showing optic nerve changes without any apparent cause, and I think it was his invariable rule where a choked disc or optic neuritis was found without evident reason that a decompression operation should be done on the skull.

I have had a similar case, a little further advanced than that Dr. McDavitt reports, a woman similar in every respect excepting that one eye had gone on to a beginning atrophy. The woman had been blind for seven or eight months. A decompression operation was done and in a very short while her vision began to return and as far as I know today she has useful vision in both eyes. As to what could be the possible cause of this condition in Dr. McDavitt's case, it would seem that as there were present double choked discs without any inflammatory conditions apparent, there must have been some circulatory obstruction somewhere in the course of the return flow of venous blood from the orbital structures. Where could that have been? Only, as I said before, after the ophthalmic veins come together in the neighborhood of the cavernous sinus. The Wassermann test was negative. There was no evidence of tumor of the brain outside of choked discs, but there must have been some obstruction to the return venous flow. Despite the negative Wassermann, there may have been a benign tumor, gumma. There may have been diopathic hemorrhage and clot. There may have been an arteriovenous aneurism between the cavernous sinus and carotid artery which is in immediate contact. Such things have been known. I should think that a very vigorous pushing of massive doses of iodid of potash, combined with decompression operation, could be tried in this case, and if so I hope Dr. McDavitt will let us know what the outcome is.

Dr. G. C. Savage, Nashville, Tenn.—There is only one of the cases mentioned in the paper to which I would call attention, the one of apparent monocular blindness. I have had some cases of this character, the result of railroad injuries when, of course, a suit would be pending unless a compromise should be made. I remember distinctly that a young brakeman was caught between two cars and without any external manifestation of severe injury he claimed to be totally blind in one eye, seeing well out of the other. There have been other cases of that character seeking pensions from the United States Government, claiming to be blind in one eye and able to see out of the other. In such case we ought to be inclined to do justice to the person claiming blindness from railroad injury or to the soldier wanting pension because of blindness. I depend upon one single sign in determining the fact of total blindness in one eye, that eye showing no fudus changes; that is, pupillary reaction. If a man is totally blind in one eye, he is not going to have pupillary reaction in that eye, except in harmony with the reaction of the pupil in the other. With the two eyes open both pupils will dilate under cover and will contract when exposed to the light even if the one eye is blind. The two pupils will respond to the same impulse, for there is one center that controls the size of the pupil. If you cover the good eye, make it absolutely dark, the exposed eye that is blind, if it is blind, will give no response whatever to the light and darkness. The case of the railroad injury had been pronounced by the railroad surgeon as not blind; that he was only simulating blindness because he could not see any fundus changes. There was nothing wrong with either the disc or the retina; no ruptures of the choroid. Yet he was blind and the railroad surgeon examining him would have known it if he had resorted to the simple little method that I mentioned a moment ago. The railroad surgeon had advised the attorney for the road not to consider a compromise in his case at all because the road would certainly win. The attorney sent him to me for investigation and I determined that the man was blind simply because of the absence of pupillary reaction in the eye claimed to be blind. I wrote him to get a compromise and he did it promptly. That is a thing that I depend upon always in determining whether a man is simulating blindness in one eye or whether he is actually blind in the one eye, there being no fundus changes. Of course if there are pathological changes in the eye we know whether it is blind or not, and know why. But when there are no pathologic changes, the blindness being due to some cause between the globe and the chiasma, I know of nothing that will help us as much as the pupillary reaction. When it is present the man sees and when it is absent he does not.

Dr. A. C. Lewis, Memphis, Tenn.—I am particularly interested in Dr. McDavitt's last case, that of retinal detachment following tooth extraction, that is, in regard to the treatment of these cases. I have been using for the last few years the corneal trephine operation in these simple detachments and have gotten some excellent results. I have not seen much literature on the subject and I should like to know what other men are doing in this line.

I recently had a case, a young man just out of the Army. I do not know how he got in the Army, because he had only one eye, vision little more than light perception in the other. He suddenly got an almost complete detachment of the retina in his only good eye. (Vision: counts fingers at two feet).

I took him to the hospital and did a corneal trephine back as far as possible between the superior and external rectus muscles and kept him in bed three days in the hospital, then transferred him to his home and kept him in the house four or five more days. In this period he got a complete reattachment and was back at work in three weeks. I have taken his visual fields and they are all normal now. His vision is 20/20 plus and I examined it two weeks ago. It has been over six months now since the operation.

I have done this operation in three cases only and have gotten excellent results in all three cases. In one of them the result was not per-

fect. The negro had syphilis with choroiditis, and he was completely blind in his only eye. That occurred two years ago and he is picking cotton today and can do it well. Another point is that in doing this operation it is not necessary to keep the patient in the hospital and on his back for several weeks or months as the old treatment went.

In the cotton picking negro I operated in my office, he went home the same day, was picking cotton two days later and still he got this excellent result. I would like to hear Dr. McDavitt's ideas and experiences in this line of treatment and of any other methods he is using.

Dr. Hiram Woods, Baltimore, Md.—A word about Dr. McDavitt's first case. This man was blind; had no light perception, but retained pupillary reaction. Note that it was two months from the appearance of symptoms before blindness was complete. You have in the pupillary reaction something definite in the way of localization. It puts the lesion pretty far back. Remember that there had been two months of fading vision and gradual loss of sight before Dr. McDavitt saw him. There is no record of peripheral vision. Had the field been taken, it is quite possible that something might have been found in the way of cerebral localization. I say this on account of my experience as a member of the Board of the American Ophthalmological Examiners. You have no conception of the neglect of perimetry among a large number of men who have big practices. One candidate told me that he had no time to take fields because he was too busy correcting refraction and treating inflammatory troubles. The time has passed when one can neglect perimetry as a routine method of diagnosis. I agree absolutely with what Dr. Jervey said about decompression. Given an edema of the retina and optic nerve and loss of sight, you have definite evidence of pressure. And even if the perimeter or other tests show a non-operative growth, decompression might save some sight, provided it is done soon enough.

Dr. McDavitt (closing).—I did not attempt to enter into pathological consideration of these cases. It was nothing more than the daily cases that come before us and I think I have seen more of the peculiar cases in the last year than I have before. A great many of them have been from the soldiers. The way that our soldiers have come back from the other side and the suffering that they are going through with in their eyes is something beyond our belief unless we are working along these lines. I am, fortunately or unfortunately, seeing a great many of this class of men in consultation and through the United States Government, and probably I am seeing more of the peculiar cases than I would otherwise. In reference to the operative procedures for detachment first spoken of by the gentleman on the right, I have never used the operative procedure that he mentions. The advice in reference to decompression of the double choked disc is valuable. This case was sent to me in consultation and everything had been done previously. He had been in good hands and I think had refused a decompression. As far as the dilatation and contraction of his pupils was concerned, I could not explain it, because the eyes were absolutely blind. The pupils were naturally a little bit dilated, but he did have some contraction and dilatation not perfect under any circumstances, but I could see the pupils move, which was a great surprise to me on account of the blindness of the eye.

MEDICAL EDUCATION

THE TREND OF MODERN MEDICAL EDUCATION*

By W. W. Herrick, M.D.,
New York, N. Y.

The ideas expressed in this paper have been formed largely as the result of experience as a medical officer in the recent war: first, as Chief of the Medical Service of a large Base Hospital, which served also as a medical training center; second, as Medical Consultant to the Department of the Southeast. This experience gave peculiar opportunity to observe and test in practical work the qualifications and professional training of a very large number of practitioners of medicine from all parts of the country. In recording impressions and resulting ideas, it is admitted that not every side of a very large subject is discussed, only that side which was most apparent in the practical work of the war. A trend of the modern graduate rather than a uniformly accomplished result was revealed. This trend and its development is emphasized, without presenting recognized arguments which may well be at variance with the views expressed.

It is unnecessary to bear witness to the patriotism, good will and high character of the medical officers volunteering their services in the war. No body of enrolled men made greater sacrifices or deserve higher credit. This paper has to do only with the technical training and qualifications revealed by the test of active military medical service, and their bearing on medical education. As noted by Foster,[1] the revelations were somewhat disturbing to one interested in this important subject. Lack of adequate professional training characterized not only a large proportion of practitioners from the rural districts, but a corresponding ratio of those from the larger centers of population. Patent deficiencies in medical education marked not only many of the graduates of medical schools classed as B and C, but also a large number of the graduates of Class A schools. Particularly in the early days of mobilization, the lack of competent medical officers, who could assume entire responsibility for the care of the sick, was in many camps alarming. Men who could properly examine a patient, and who could with speed and decision take the measures that modern medical methods approved were rare indeed. Men so qualified were generally placed in a class by themselves and with little delay assigned as chiefs of service in an organized or organizing unit. The difficulty in finding enough men to fill these positions properly was one of the most serious problems confronting the advisory staff of the Surgeon-General's office.

The medical graduates of ten years or more ago were products of that unhappy period in medical education effectively exposed by Dr. Abraham Flexner, which is passing. It is, therefore, scarcely profitable to recount the shortcomings of the professional training of what is practically a by-gone time; but the product of existing methods and its response to the trial of military service may well claim our attention. It should be borne in mind that the test to which the medical officer in a base hospital was subjected was a clinical test. It was a test the practitioner is called upon to meet in his daily work; but it was more thorough, more voluminous, and surrounded by a cloud of witnesses. The recognition of disease and treatment, both curative and preventive, were the beginning and the end of this test. How did the average medical man meet it?

The outstanding features were the lack of adequate clinical training, and the avidity with which the average medical officer improved the opportunities that were offered to secure it. In addition to the rare man of consultant calibre, recent graduates with two years of training in large general hospitals of the first class were those best equipped for the work. Judging from the capacities of those having had but a single year of hospital work,

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this is an insufficient period in which to give the medical graduate the clinical experience necessary to the proper independent care of patients.

The late T. C. Janeway[2] has emphasized the fact that medicine is not only an applied science, but it is in equal measure a practical art. The medical educator must, therefore, strike a proper balance between the training in the sciences that constitute the so-called premedical studies and that in the art by the exercise of which the graduate is to serve his generation.

There is no question that the exponents of the sciences contributory to medicine in general came off with honor. In most camps the bacteriologist, pathologist, serologist or chemist came to the fore and gave proof of the competency of his training in the successful way in which the large laboratory problems were met. The readiness with which so many younger medical men took up these tasks was a fine tribute to this side of their professional education. Did the exponents of the practical art—the clinicians—come off so well? It must be confessed that at first they did not. They developed, and developed rapidly, in the spirit of progress which pervaded most of the large base hospitals and in the opportunities for clinical instruction which were afforded by the medical teachers collected in these places; but in the early days the defects of their training were stripped bare. I believe it a correct estimate of many of the graduates of medical schools organized upon the most modern lines that the rigorous practical test of war service revealed them deficient in both conception and exercise of medicine as a practical art. In their undergraduate training, and too frequently even in post-graduate work in hospitals devoted to teaching, many of these men had had little or no revelation of clinical medicine in its relation to practical human problems, of its larger significance as an art. With a not unimportant fraction the use of instruments of precision and the employment of laboratory methods, not all of which had sustained the test of usage, occupied a more prominent place in their armamentarium than the direct examination of the patient. Among many recent graduates, whose opportunities for training had been large, this surprising lack of skill in physical diagnosis and the disposition to substitute the findings of the laboratory for the more tried, direct methods of clinical medicine were frequent obstacles to effective work in the wards of the base hospital.

Is not the historical relation of this phase of the subject of more than academic interest? In this country a hundred years or more ago, the chief method of medical education was the apprentice or preceptorial system. The practitioner took the professional aspirant into his office and often his home. The apprentice had constantly before him as a model an active and generally successful exponent of the practical art of medicine. The defects of this method have long been obvious. The tendency to perpetuate opinion and personal bias, unchecked by a common source of common exchange of knowledge, and uncontrolled by the exact methods of pure science, naturally led to the handing down of much unscientific tradition, from which we are even yet scarcely emancipated. As medical education became an institutional function, the didactic lecture supplemented the purely clinical teaching of the apprentice system, and this is a method which in some places is still enjoying too hearty an old age.

With the rise of the biological sciences, physiology, physiological chemistry, pathology, bacteriology and immunology and their relation to medicine, the teaching of these subjects appropriately fell into the hands of men especially trained in them, who were lent from the faculties of pure science to the faculties of medicine, while the practitioner rather clung to traditional methods and but haltingly applied the rapidly evolving means of science to his every day work.

The practitioner has, in all this evolution of science applied to medicine, given over an increasing share in medical education to the more unhampered and perhaps more progressive exponents of pure science or of educational theory, until at present the organization of important medical training centers tends to fall into the hands of those who have never practiced, and who in important instances have never studied medicine, and who are in consequence largely unfamiliar with the work of the practitioner. That this is

chiefly the fault of the practitioner can not be gainsaid. Absorbed too much in medical profit and too little in medical progress, the practitioner has not made the sacrifices necessary to give his contributions to education the requisite scientific basis, and perhaps has deserved the present tendency toward his elimination from teaching forces and teaching hospitals. It may be said in his defense, however, that until very recently the teacher-consultant has had scant resources at his disposal, and where laboratories, libraries and other facilities have been at his hand, productive work of high value has often been done.

The question may well be asked if the carrying out of a plan which excludes the practicing or consulting physician from any large share in the instruction of the future practitioner will not result in placing greater and greater emphasis upon medicine the applied science, and less and less upon medicine the practical art, with unhappy results to the practitioner graduate. The institutional life which a scheme of organization, such as the so-called rigid full-time plan enforces, will perforce attract men of the student type, who prefer the exercise of their faculties upon problems which are more or less theoretical, and who, by their prescribed habits of life, naturally tend to withdraw from competition in the arena of everyday affairs.

These instructors must be contented with meager salaries; even the heads of departments receiving compensation demanding severe sacrifice by men capable of attaining pre-eminence in consulting practice, and only a man of this calibre should be chosen head of a department of medicine. The man who has the capacity, personal and professional, to achieve large success in active professional life, the man who has the requisite endowment of intellect with the qualities of leadership, of energy, ambition, decision, tact, human sympathies, and all the complex equipment of mind and heart which are required to achieve a dominant position among his fellows, will naturally avoid the limitations enforced by a rigid academic career.

In the "Education of Henry Adams," we find this remark: "No man can be a teacher, a preacher, or a senator for more than ten years and be fit for anything else." If we make our medical teachers teachers only with activities confined to institutional work, and deny them the chance to sharpen their wits by consultation with members of the profession at large on a normal basis, are we not making them sterile clinicians from whose minds the claims of the sick will be gradually excluded?

The danger is probably less with the present generation of full-time teachers, since most are experienced clinicians who have been attracted largely by the opportunity to do pioneer work. As time goes on, however, and the system develops, there promises to be an insidious replacement of the active clinician by a type bred largely of institutionalized conditions, with research rather than practice the ultimate purpose, lacking the drill that comes only from the assumption of undivided responsibility for patients and who, while replete with methods of application of the sciences ancillary to medicine, is ill-fitted to give the student the essential clinical point of view.

It may be objected here that the medical school is the only place where the student can gain instruction in laboratory method; that laboratory method is fundamental and that without it the graduate will be unable to evaluate the mass of experimental detail which is constantly offered the clinician as an adjuvant to his daily work. No one can dispute the validity of this opinion. It does not follow, however, that the clinical aspect of medicine may be relegated to the years of practice. The observation of large numbers of medical officers shows that if the medical student is not given adequate instruction in physical diagnosis, and is not impressed with the importance of the information gained from use of the practiced senses in the direct examination of the patient, and is unaccustomed to ready judgments based largely upon the sifting of such evidence, he is too often helpless in the presence of the decisions he is called upon to make in actual clinical work.

It is my opinion, based upon wide observation of medical officers, that if these capacities are not developed, at least in embryo, during the medical course or during the years of interneship immediately

following it, they are seldom acquired at a later time, and the practitioner continues on his way with limited conceptions and capabilities.

The clinical test of military medical service, therefore, brought to light widespread deficiencies in clinical training. In a sentence, the modern graduate too often lacks the concept and the exercise of medicine as a practical art. What that is constructive can be gathered? Having passed through the phases of the apprentice system, that of the didactic lecture, and the present period of ascendancy of laboratory over clinical method, medical teaching will have "come full circle" and again arrive at the preceptorial system—a system of apprenticeship of the small group to the active exponent of practical medicine.

In the fourth year a separation of students into two classes might be made with profit: the first class, including the few choosing to devote themselves to the accessory medical sciences as teachers or research workers; the second, comprising those who would practice. Such a division would at once save the great amount of time lost in any system aiming to make research workers of men of average intellect or bent.

The student electing to practice should have two years of practical clinical work in dispensary and hospital with research entirely subordinated to the care of the sick. No graduate should be allowed to practice without having had at least one year of purely clinical training. Observation of the recent graduate shows that two are really necessary, and it is for two clinical years I would plead.

This hospital training should not be on the older model in which the instruction of junior members of the staff is given over to the seniors, but should be in the hands of active consulting or practicing physicians, to whom no interne-students should be entrusted unless a proper system of clinical teaching is in vogue in their hospitals. No fifteen minute rounds by practitioners engrossed in their personal clients should be allowed. Here, then, is the field of the young clinician of promise. Let junior hospital positions be made on a temporary basis during efficient service only, in which graduates of less than ten years' standing in whom the claims of practice do not loom large, shall assume the obligation of that systematic clinical instruction without which no amount of training in the premedical studies or in medical theory can make safe practitioners. I would emphasize that this clinical training should be carried out by those familiar with the problems of practice and that research should be during this period a minor consideration. The student who chooses to devote himself to the ancillary medical sciences as teacher or research worker may choose other paths, but for him who would care for the sick, there is no other wise course.

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49 *E. Fifty-third Street.*

DISCUSSION

Dr. J. M. Hutcheson, Richmond, Va.—The deficiencies which Dr. Herrick points out may be traced in a large measure to the lack of emphasis in our present curriculum on medicine as a practical art, and also the failure at times on the part of many of us on whom instruction devolves to appreciate the full significance of clinical teaching. Two years devoted exclusively to training in the care of the sick is not too much for those who would practice. At present that is rather a remote ideal, still I feel that we should hold to it as an ideal. During this period the student is not only exercising his senses and mental faculties, but he is developing more rapidly than at any other period the principles of thought and action which will do more than anything else to form his attitude toward his profession. The importance of example and influence have been dwelt upon in the discussions we have just had. The development of the clinical instinct of which Dr. Herrick speaks is to a greater extent dependent upon the example and influence of the teacher than upon thoroughness in technical instruction.

Dr. Robert Wilson, Jr., Charleston, S. C.—We are all impressed by the fact, to which our attention has been drawn so often recently, that clinical teaching has not kept pace with laboratory teaching. For some reason our clinical teaching has been very defective, and we have not been turning out men sufficiently well equipped to grapple successfully with the problems of medicine. The perfection of laboratory methods and the value of laboratory contributions to clinical study has led us to depend too much upon the laboratory and too little upon clinical observation, but I am glad to say we are getting away from this viewpoint and are appreciating more and more the importance of bedside study.

The institution of the full-time teacher in medicine is an effort to raise the standard of clinical teaching, but I feel with Dr. Herrick that we are not yet in a position to dispense with the consultant and the general practitioner as teachers. These men can give the students something which they whose whole time is spent in hospital wards and in teaching can not give. The suggestion made by Mr. Elkin is an admirable one—that the full-time teacher be made the head of the department with part-time teachers, who are also engaged in practice, upon his staff. These part-time teachers should receive some compensation for their services as teachers. I am quite sure that adequate compensation would be conducive to better work by clinical teachers.

With regard to Dr. Herrick's suggestion that we differentiate between students in the fourth year, it seems to me that this would be rather difficult. We may study their tendencies during their fourth year so that we can advise and direct their futures, but differentiation seems to me to be a post-graduate, rather than an undergraduate, function. Our fundamental purpose is to turn out general practitioners. The development of research workers and specialists must come later. Our tendency has been to give too much attention in under-graduate work to the teaching of the specialties, and I am glad to say that we seem now to be getting away from this, laying more stress and giving more time to the teaching of general medicine and general surgery.

Dr. Chas. L. Minor, Asheville, N. C.—I am glad to hear a voice crying in the wilderness. Dr. Herrick has talked what is very much needed in these days, common sense. Too many men have been afraid to say what they thought on this subject because of the wonderful hold that science has upon our respect and our imagination. Every man here tries to be scientific in his work, but the reverence for science has imposed itself upon us almost as much as before the recent war a reverence for German knowledge imposed itself upon us. Again and again I have raised my voice for the importance of cultivating the art of medicine as well as the science. Science is the most essential part of medicine today. Its discoveries are so wonderful that it is quite natural that many men come to think that pure science is the whole aim of medicine. But as a human being is not merely a body, but also mind and soul, it takes art as well as science to understand his ailments and their reaction on the complex structure of human beings.

No one wants to go back to the old days when medicine was empiricism with no science in it at all. But the pendulum which is now almost at the full end of its swing is going inevitably to come back nearer to the center, and while it may very well swing too far the other way, men, while reverencing science and using it, will realize better that the first principal of medicine is to seek truth in order to cure disease, and not for truth's sake alone. In our profession science is beautiful because of the goal it brings us to, the goal of restored humanity.

We all consider modern diagnosis wonderful, but in teaching men to cure disease we must teach them more than diagnosis. How often have you seen a young scientist, a skillful diagnostician, helpless at the bedside because he had not mastered the art of medicine. I recognize that to learn the art of medicine in a medical school is almost impossible. Even in the general hospitals, where our more ambitious students work, it is very difficult to learn at the bedside of the ward patient, and even in the private patient's room it is hard, because we are only representing the visiting doctor while he is away. But it is indeed a pity that each young doctor can not have a year or two with some good clinician, if possible such a man as was Austin Flint. He would not merely learn science, but the practical application of science, which is an art in itself. The patient in bed would be more to him than number so and so, would be a human being and not only a body. He would have a chance to learn the psychological side of our calling.

One of the gentlemen has said that the teacher must be first and foremost a research man. I beg to differ with him. Some teachers must be research men, but if all our teachers were research men, it would be most unfortunate for our students and our schools would not turn out useful bedside doctors, however excellent investigators they might be. As in everything else, we must seek the happy medium and not go to extremes on either side, and our medical teachers must take such a broad-minded view of the profession as to turn out doctors who are not merely scientists or merely artists, but broad-minded men.

As to the increasing of our teaching force, it is certainly most desirable if that will allow of a more intimate contact between the student and the teacher and a better opportunity for the student to learn from that teacher the art and science of medicine. I trust that the discussion here today will bring us nearer to that point.

Dr. Ernest Sachs, St. Louis, Mo.—I have had the good fortune to teach medicine under two systems—as a part-time man and as a full-time man. I am not thoroughly in sympathy with the full-time plan as I have seen it work. It has serious defects. It is only in the experimental stage. I have followed teaching for a number of years and I am very much impressed by this point, which is quite general all over the country,—that medical schools, realizing that one of their prime functions is to teach medical students, nevertheless select their teachers not on the basis of whether they are teachers, but on the basis of whether they are investigators. This is a fundamental error. We have in many of our schools all over our country admirable investigators as members of the department who are wretched teachers, neither being interesting as teachers nor having the power of presentation. One of the things that we must emphasize is that the teacher of medicine, in addition to knowing his subject and to being interested in research work and carrying on research, must be

primarily interested in teaching and know how to present his subject to his medical students.

Dr. Lewellys F. Barker, Baltimore, Md.—Two papers of my own deal with these problems of the whole-time professor and the part-time teacher in the medical schools. In one of them, written in 1902, entitled "Medicine and the Universities," I urged that the medical schools be put upon a true university basis and that whole-time professors as well as part-time professors be provided for in the schools; and in the other, written in 1911, entitled "Some Tendencies in Medical Education in the United States," these topics were further dealt with, the functions of a department of internal medicine were analyzed and described, and some of the difficulties likely to be met with in adjusting the respective activities of the whole-time men and of the part-time men were discussed.

I have always been, and still am, a hearty advocate of the whole-time professor in the clinical branches, but I have always maintained, and still maintain, that there is also need for the part-time professor in these same clinical branches. There should be a division of labor among these two types, and, in good organizations, we shall expect to see arrangements made through which each of the types will give of his best to the work of the medical school and of the teaching hospital. There is plenty of room for the activities of each of the two types in every large clinical department, and it is important that the medical student shall have opportunity for close contact with the work of the whole-time clinical men on the one hand and with that of the part-time clinical men on the other.

The whole-time clinical chairs have been advocated for the reason that the work of the modern clinics has become so great that more time and energy must be given to it by at least some of the leaders than is compatible with the exigencies of a large private practice. There is certainly great advantage in having certain of the clinical leaders sufficiently salaried to permit them to devote all of their efforts to the promotion of the institutional work, including, besides the general executive duties, the care of hospital patients, the teaching of students and the conduct and supervision of original research. The restriction of the activities of such leaders to the sphere of the institution frees them from the clamor of private patients and the attention these entail. The absence of any need of supplementing their income by extra-institutional work gives such whole-time professors leisure and quiet minds for the performance of their academic duties and for the enjoyment of their privileges.

The part-time clinical chairs are necessary also in order that some of the teaching of students may be done by men who are actively engaged in private practice. For one reason there is not, nor is there likely to be, money available to provide salaries for enough good whole-time men to carry on all the work of the clinics. Part of the work must, therefore, be done by part-time men. Such part-time clinical teachers are important mediators between the medical school and the public. Students, too, are beneficially stimulated by contact with teachers who have made a success in the kind of career to which they themselves look forward, and the majority of students in the medical school are prospective private practitioners. Further, the clinical teacher who is in private practice, either as a general practitioner or as a consultant, has, better than the whole-time clinical teacher, the opportunity to become acquainted with the conditions under which private practice must be conducted and with the problems that confront, and the difficulties that beset the path of, the men who do private practice. If students know that at least some of their teachers are practically familiar with the circumstances of their future occupation, it gives them greater confidence in the curriculum and the assurance that their practical needs after graduation are being given due consideration. Moreover, the influence for good of the part-time professor of the right type on the character of medical students should not be under-estimated; for is not character development fully as likely to be favorably affected by one who has been exposed to the dangers of the sea of temptation of private practice and has learned safely to swim in it as by one who has been so hedged round by safeguards that he has had no way of finding out what would happen to him if he fell into such a sea? If the medical schools of the universities were not to provide adequate opportunities for part-time clinical teachers as well as those for whole-time men in the clinics, it would become necessary for the sake of the part-time teachers themselves, for the sake of prospective practitioners, and, above all, for the sake of the public, to establish institutions in which they would be provided and to which the graduates of the whole-time school would resort for an important subsequent training. If we keep in mind the fact that students need not only to be taught the pure sciences of diagnosis and therapy, but also to be trained in the applied sciences of diagnosis and therapy, and to acquire skill in the diagnostic and therapeutic art, it does not seem likely that our wiser educators will, in their desire to make the conditions of whole-time tenure appealing, exclude part-time clinical teachers from the medical schools entirely or deny them suitable opportunities for work.

All our educational reforms are tentative. We must find out how they work before we give them our full sanction. We are now frankly engaged in an interesting experiment trying to evolve the whole-time clinical professor, but this does not compel us to relinquish the benefits that the part-time clinical professor can yield. A William Osler or a William Mayo in a medical school would exert an excellent influence, whether enjoying the freedom of a whole-time chair or limited in his teaching activities by the pressure of affairs in the outside world. We must avoid idolizing the mere machinery of organization; it is best to fit elastic organization to men rather than to mutilate men by attempting to force them violently into some Procrus-

tean uniformity. It is in this sense, I take it, that Dr. Herrick has spoken.

Dr. W. F. R. Phillips, Charleston, S. C.—I have for a long time been of the opinion that we could not dispense with either the whole- or part-time teacher. The student is taught medicine as practiced in the hospital and this is radically different in many respects from what he must do when he goes out to earn his living in private practice. It is just as important that he should learn the conditions he will encounter in private homes as it is that the nurse should be trained to the conditions she must meet in the private home. I have heard our nursing training severely criticised on the ground that when nurses go into private homes they require to be waited on because they were used to it in the hospitals. They do not know how to wait on themselves or to accommodate themselves to the conditions of the private home. We need the whole-time man, but if he is trained from the very beginning as a whole-time man he will not know how to meet the conditions of private practice. He, himself, needs those things which are to be learned in the private home.

As to training students for research, I do not think that we should attempt to do that. We should train them to practice medicine first and let research come afterwards. The late Dr. McAlister, Professor of Anatomy at Oxford, said that he would not have been able to teach anatomy if he had not been first an interne and later a number of years on the visiting staff of a hospital. That applies to every teacher in the medical school—he must have the viewpoint of practical medicine. We make a mistake when we attempt to train men for research work before we train them for the art of medicine and the science of medicine.

Dr. Herrick (closing).—A number of points emerge with some clearness from the papers and discussion. The first is that the training in the preclinical or laboratory studies is in the main satisfactory, not only to the clinicians, but also to the exponents and teachers of these subjects; therefore, these subjects can be dismissed from present consideration.

The second point is that clinical teaching is defective, even when organized along what are in theory the most approved lines.

The third point concerns the importance in clinical instruction of the part-time teacher who is familiar with the problems of general and consulting practice and the recognition of his services as of equal value to those of the full-time institutionalized teacher.

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EDITORIAL DEPARTMENT

HEALTH AND EFFICIENCY

This is the age of efficiency. The greatest desire of every man and every woman is to be efficient in the line of work in which he or she is engaged. Business efficiency is aimed at everywhere. Banks, mercantile establishments, manufacturing industries, and all kinds of enterprises are run on an efficiency basis; and great corporations have efficiency experts who are paid large salaries to study their organizations in order to advise methods for increasing output and decreasing expense.

Why all this mad race for efficiency? Because it gets results. It pays. The most efficient man gets the best positions; he is paid the highest salary; he has the greatest prestige, and he is usually the happiest man, because the greatest joy in living comes from the "consciousness of work well done." The enterprises that are managed on the highest plane of efficiency are the most successful financially and in every other way; and the nation that is governed with the highest degree of efficiency does most for its people and for the world.

EFFICIENCY AND PERSONAL HYGIENE

Efficiency may be defined as applied skill, energy, and endurance; and two of these three qualities depend upon health. The care of the body, therefore, is the most essential consideration in efficiency. The reason that the American soldier did the best fighting in France was because he was best equipped physically as well as mentally. He was the soberest, the cleanest, the best fed, and the best cared for soldier in France. He may not have had the fighting skill of the veteran soldiers of Europe, but he had the courage, the strength, and the endurance that more than made up for the lack of military training. After all it is health that accounts for the prowess of the American soldier, as it is health that makes most for his efficiency in peace.

While Americans are the most efficient people in the world, we have yet much to learn about efficiency, particularly in its relationship to personal hygiene. The advancement in preventive medicine in the last quarter of a century has brought about an enormous reduction in the death rates from tuberculosis, typhoid fever, scarlet fever, diphtheria, and other infectious diseases; but during the same period there has been considerable increase in the death rates from the degenerative (brain, heart, kidney, arterial) diseases. These diseases usually impair the earning capacity of their victims for years before death ends the struggle; so that measures for preventing chronic diseases will aid in increasing the efficiency of the Nation.

The results accomplished in the attacks on infectious diseases have come largely from campaigns of education, which have taught all classes of the public the important facts regarding the contagious or transmissable diseases. The causes of the chronic diseases are well known to physicians, and an earnest effort is being made by many leading men in the medical profession to inform the public regarding the errors in daily living that decrease efficiency and longevity.

These efforts have proved discouraging at times because men and women are too

busy to think about themselves. They are too much interested in the game of life (law, medicine, politics, rearing children and the thousand and one other useful vocations) to have their minds diverted into channels of thought about personal hygiene; and only too often they regard as cranks those who talk about preventing chronic diseases, which they accept as the "ills that human flesh is heir to," and not the infirmities of their own making. They can not be made to see that by living rationally five, ten or twenty years can be added to their lives, and at the same time they can be happier and more useful in their vocations.

PHYSICIANS AS EFFICIENCY EXPERTS

It is the desire to be efficient, as much as the inherent longing to prolong life, that is causing business men to give more attention to their bodies than ever before. They are willing to pay for the annual or semi-annual physical examination, because they believe it is to their business interest to keep well rather than to wait until they are ill to consult a doctor; and they are following the advice of their physicians by regulating their lives so that they can maintain their maximum degree of health and efficiency.

The physician who is so skilled in diagnosis that he can recognize the early evidences of disease of the heart, lungs, brain, stomach, kidneys and arteries; and who is prepared to advise his patients regarding the proper diet and the amount of work, rest, recreation, and exercise that he should take to be restored to the normal before serious disease results, is really an efficiency expert; and an enlightened public is beginning to appreciate such service. Educated and progressive men and women are also beginning to ask the advice of the best doctors they can find to advise them how to live to keep in the best possible physical condition, even when they are enjoying good health, and when they are accomplishing most in their daily lives.

COLLOID GOITRE

A few years ago when the writer was a house officer in Cleveland, he used to amuse himself by counting the number of goitres among the women passengers on the street cars. ("V-necked" dresses were then as much in style as they now are.) So common was thyroid enlargement that the proportion observed was something like one in every four. One may even find dogs with enlargement of the thyroid in the Great Lakes region.

The subject of goitre fascinates at the same time it often perplexes us. Plummer, of the Mayo Clinic, holds that all goitres may be classified as (1) colloid, (2) adenomatous, (3) hyperthyroid, and (4) combinations of these. The simplicity of such a grouping commends itself to our consideration.

Thyroids are prone to so-called physiological hypertrophy during the two extremes of the reproductive period of life and during gestation itself, i. e., at puberty, during pregnancy and at the menopause. These physiological conditions may initiate actual pathological changes. The adenomatous and hyperthyroid types are usually readily recognized and their treatment is, generally speaking, principally surgical. One is surprised at the number of simple colloid goitres, i. e., those occurring as bilateral, diffuse, rather soft enlargements which exist untreated. Since no pain is caused,—if not large enough to exert pressure, no symptom is produced other than nervousness over the mere existence of the tumor,—and since the patient suffers no discomfort, these unsightly growths are often allowed to remain untreated, although the method of their removal by medicinal means has long been known. However, the rank and file of physicians do not seem to appre-

ciate the simplicity nor the efficacy of the treatment. Any of the common forms of iodine such as Lugol's solution or the syrup of the iodid of iron, may be used. Since combinations with other types of goitres may exist, the patient should be watched most carefully for a lighting up or exacerbation of hyperthyroid symptoms; and if they appear, the iodine should be discontinued at once. A very satisfactory prescription is to give eight drops of the syrup of the iodid of iron in a little water through a drinking tube, three times a day, for, say, six weeks. Then skip a month and begin again. If the goitre has been properly diagnosed as a simple colloid type, a rapid diminution in size and return to the normal may confidently be expected. Should the goitre be a combination of the colloid and adenomatous types, the colloid portion will disappear and the adenoma remain. In view of the specificity of iodine in the removal of colloid goitres, it seems rather paradoxical to call attention to the well-known experimental work of producing goitres in fish by introducing iodine into their water.

Another practical point that is well to be remembered in connection with goitres is that in the hyperthyroid type (Graves' disease) adrenalin is not borne well either when administered as such or when in combination with local anesthetics, as, for instance, in ligating the superior thyroid arteries.

MUSHROOM POISONING

During the summer there are a number of poisonous plants that are often mistaken for the edible varieties. More deaths occur from eating the poisonous varieties of mushroom than from other toxic plants that are indigenous to America, but it may be well to mention that several cases of poisoning from the roots of water hemlock (Cicuta maculata) which had been mistaken for horseradish, artichokes or parsnips, have occurred in Kentucky and other Southern states. A number of deaths from such mistakes are reported every year.

Mushroom poisoning is of much more frequent occurrence in Europe than in America, because the mushroom is considered a great delicacy on the continent and is eaten more by the Europeans than by Americans. Mushrooms, however, are being eaten more than formerly, and since there are a number of the poisonous varieties of mushroom that are indigenous to various parts of the United States, we may expect more cases of poisoning from this source.

It is customary for authors to describe the differential points between the edible and the poisonous varieties of mushroom. The writer is of the opinion that the selection of mushrooms for eating purposes should be left to experts. Since he witnessed autposies on four persons, who died as a result of their inability to discriminate between a mushroom and a toadstool, he realizes the danger from eating mushrooms. Since then he has not been able to eat this delicacy with the same degree of relish as formerly.

Mushrooms have but little food value, and since more cases of mushroom poisoning are being reported every year, it seems that the eating of this fungus that grows in dark places should be discouraged. Even if there is only one case of poisoning in every 100,000 who eat mushrooms every year, since it is not essential food or even a very nutritious one, the 100,000 can afford to do without an occasional article of diet to save even one life. Jordan[1] states that "in the vicinity of New York there were 22 deaths from mushroom poisoning in one ten-day period in September, 1911." Jordan also reports the death of Count de Vecchi, an attache of

1. Jordan, Food Poisoning, University of Chicago Press, 1917.

the Italian legation in Washington, "considered something of an expert on mycology," who died from eating mushrooms which he himself had selected from one of the Washington markets.

The edible variety of mushrooms, the Aminita Cesaria, is indigenous to the United States, and it is also grown to a small extent for marketing in this country; but most of our supply is canned and comes from France, where it is grown in caves and other dark, damp places. The poisonous varieties of this fungus are the Aminita muscurari and the Aminita phalloided (death cup). They contain an alkaloidal substance, muscarin, a violent poison, which is responsible for the illness. Muscarin is said to produce hemolysis, which probably accounts for some of the symptoms.

SYMPTOMS AND TREATMENT OF MUSHROOM POISONING

The symptoms of mushroom poisoning usually come on four or five hours after eating, though in some cases the time of onset is a few minutes after the ingestion of the mushrooms. In some cases there is a prodromal period of fifteen hours. The first symptoms are usually abdominal discomfort which soon increases to intense pains, with violent retching and vomiting, diarrhea, and sometimes bloody stools. Prostration is extreme, the skin is icteric, cold and clammy, and there is a rapid loss of flesh. Drowsiness followed by coma and death in from four to five days is the usual course, although recovery from mushroom poisoning has been known, when small quantities were eaten, and the stomach promptly emptied.

The pathological findings in mushroom poisoning are much like those of acute yellow atrophy of the liver. The autopsies which the writer saw showed a marked reduction in the size of the liver, with extensive fatty changes in the liver, kidneys and myocardium.

In the treatment of mushroom poisoning the most important indication is to empty the stomach, if possible, before the poison gets into the intestines. Lavage is the best method. If the condition is not discovered within five or six hours from the time of the ingestion of the mushrooms there is very little hope from any form of treatment. Atropin is the physiological antidote for muscurarin and should be given in large doses, 1/50 grain or even 1/25 grain, until the physiological effect is produced. Since the hemolysis is probably the most important change in mushroom poisoning, it may be that transfusion, or the intravenous use of a normal saline, or alkaline solution would be helpful.

MALARIA PROPHYLAXIS

Much excellent work on the control of malaria was reported at the Asheville meeting of the Southern Medical Association in November, 1919. Methods of prevention of the spread of malaria by soil drainage, by destroying breeding places, by destroying the anopheles mosquito through introducing minnows into the water, by oiling the water, by house-screening, and by quinin sterilization of the human host, were discussed. The cost per capita of different methods was tabulated, showing interesting figures. Each of these methods has helped in its place. The use of minnows is probably cheapest, but is not always applicable. The surest, apparently, but not always the most desirable, is the quinin sterilization of the human host.

The method of quinin dosage for malarial treatment is fairly general, although there is much disagreement as to the minimal quantity of drug necessary. The JOURNAL believes that the definite standardized dosage that has been decided upon

and advocated by the National Committee on Malaria[1] should be generally adopted by physicians residing in palludial localities. Not that such a dosage should be an iron-clad rule, but that it should be a guide to those who have had less experience than the clinicians and public health specialists of the National Committee on Malaria.

Aside from the fact that it does not strike at the cause of malaria, the objection to quinin sterilization is the possible toxicity of the drug. It is generally agreed that intravenous, intramuscular and subcutaneous injections are dangerous.[2] They are often followed by irritation and abscess. It is possible that quinin taken by mouth also injures the tissues, though it reaches them in such dilute form that the injury produced, or the effort to resist it, may not at the time be apparent.

A drug administered is as a rule for a specific purpose, and its action has been studied under widely varying circumstances, but obviously it is impossible to study every effect upon the body of any drug. We are able to perceive only the most obvious results. Quinin is recognized as a specific for malaria, just as mercury is for syphilis, etc. Yet the action of these on the hundreds of complex parts of the body is little known; if a part is merely weakened, little attention is paid the matter because it is not apt to be recognized. The body is too complex for every aspect to be studied in relation to every drug. The phenomena which we are able to observe are chiefly the spectacular.

Malaria is spread only when the female anopheles mosquito bites a person infected with malaria. The mosquito then becomes infected and spreads the organism whenever she bites any one else. It is for this reason that the administration of quinin to the whole population in a malaria district has been suggested to prevent the infection of the mosquito. This method of prevention should be effective, but on account of the possibility of injury of normal persons from quinin, this method should always be held the most costly. Unquestionably quinin should be administered to malaria patients and carriers.

Mosquito control is the best and in the long run the cheapest method for eradicating malaria; but in infected localities where it is not practicable to destroy the breeding places of the anopheles, wholesale quinin sterilization should be practiced, because it is surely less harmful to the individual than the toxins of a disease with such protean manifestations.

1. Editorial, Southern Medical Journal, Vol. XIII No. 4 (April, 1920), p. 296.

2. Editorial, Jour. A. M. A., Vol. XXVII, No. 7 (Feb. 14, 1920).

REASONS FOR A NATIONAL DEPARTMENT OF HEALTH

No one doubts the need for increasing Federal activities in co-operation with the state public health authorities for the prevention of disease, but there is an honest difference of opinion as to how the desired results may be obtained. The JOURNAL believes that a national department of health is the best plan for securing adequate protection for the more than 100,000,000 citizens whose health and lives should be safeguarded by our Government. The very fact that the Nation considered the prevention of disease of sufficient importance to create a department charged with carrying on health work would create in the minds of the people of the United States a respect for personal hygiene and public sanitation that would mean much in the co-operation by the public with the national health authorities in their effort to prevent disease.

Health and life are surely of as vital importance to the welfare of the Nation as agriculture, commerce and labor, the governmental functions of which are pro-

vided for in great departments, with officials at their head who sit in the President's Cabinet. Property and life are protected from foreign invasion by the War and Navy Departments. Is it not of as much importance to the welfare of the Nation to protect its citizens from preventable diseases, enemies that disable and kill more people in the United States every year than have been wounded and slain in all the wars in our history?

"Health is a purchasable commodity" is a trite saying; but it may be considered as a truism that the effectiveness of national public health work depends to a large extent upon the size of the Government appropriations for that purpose. The United States Public Health Service has done magnificent work considering the penurious policy of the Government in providing funds for the prevention of disease. It is now one of the small bureaus of the Treasury Department and the Secretary of the Treasury probably devotes as much as eight hours a month to the consideration of the Bureau of Public Health, and then he feels that he is taking time that is needed for what he regards is more important business. Does any one doubt that a cabinet officer devoting all his time to the duties of Secretary of Health would be able to secure larger appropriations and more effective administration for his department than could be secured in any other way?

A Cabinet officer must necessarily be close to the President, and he also must be a man of influence in the administration or he would not have received his appointment. It is therefore certain that the administration in control of both branches of Congress would support any measure that he might advocate. A physician in the President's Cabinet, in one year, could bring about more constructive legislation for the prevention of disease than we have been able to secure in a decade. From the viewpoint of practical politics, an important consideration when the public treasury has to be opened for appropriations, a department of health with a physician in the President's Cabinet is our best hope for adequate support for national public health work.

THE SUGGESTED HEALTH COMMISSION

There are those who favor a health commission, somewhat on the same plan as the Interstate Commerce Commission, feeling that such a plan would remove public health from the mire of politics. In the first place, it is impossible, and it is questionable if it is desirable, to eliminate politics from governmental activities; and all the commissions now in existence are entirely dependent upon Congress for appropriations. The practical politicians in the Senate and House of Representatives are not always impressed by the needs of the country, unless the party in power is responsible for the conduct of the particular matter under consideration.

We have witnessed in the past few months the effort to destroy the usefulness of the Federal Trade Commission and the Tariff Commission by cutting their appropriations to a point where most of their activities would cease. A health commission would be without political influence and it would be difficult for it to get the money for efficient work. Undoubtedly it would be ideal to have a number of trained sanitarians as life members of a health commission, but in the opinion of many it could never expand and be the efficient force for public health on the large scale that is to be expected in a great country like the United States.

The medical profession of the United States is interested in the establishment of a department of health from the most altruistic motives. It is only because physicians know of the need for preventing disease that they are always to be found

working for legislation to protect the health and lives of the public; and it is to the eternal credit of the medical profession that we have local, state and national public health organizations that save many thousands of lives each year. It has been the medical profession that has educated the voters regarding public hygiene until those office-holders, who usually desire to do what their constituents want, provided it is right, have been willing to appropriate money and enact laws to protect the public from disease. It is therefore certain that if legislation providing for a national department of health is enacted, physicians must so impress the President, the Senate and the House of Representatives of the need for the measure. The statesmen in Washington must also be convinced that their constituents desire such legislation. For these reasons the organized medical profession should decide without delay upon the legislation desired and then launch the plans for securing the Nation's greatest need, i. e., a national department of health.

THE NEW ORLEANS MEETING OF THE AMERICAN MEDICAL ASSOCIATION

The recent meeting of the American Medical Association was one of the most successful in its history. The attendance was not so large as at some of the previous meetings and was made up largely of the physicians residing in the Southern states, thus manifesting their loyalty to our great national medical organization.

The New Orleans committees deserve great credit for the excellent arrangements for the meetings, particularly those for the sessions of the scientific sections. It was feared that the hotel accommodations would be inadequate, because even when no conventions are in session the hotels in New Orleans are crowded; but the committee perfected arrangements to care for many of their guests in private homes and the hotels reserved liberal space for those who attended the convention. The celebrated French restaurants in New Orleans were popular places for the visiting physicians; and it was generally agreed, by those who enjoyed the gastronomic delights of Creole cooking, that the culinary art has reached its perfection in the Crescent City. The New Orleans physicians were delightful in their individual hospitality and they were conspicuous whenever visitors desired information.

The section meetings were fully up to the high standards of previous years and there was the dissemination of information regarding scientific medicine and surgery that has made the American Medical Association the greatest medical organization in the world. One of the notable addresses was that of the President, Surgeon-General W. C. Braisted, who, among other recommendations to the Association, advocated a National Department of Health with a physician in the President's Cabinet.

Dr. Hubert Work, who has been Chairman of the House of Delegates for many years, was elected President. New Orleans and the South were honored by the election of a former President of the Southern Medical Association, Dr. Isadore Dyer, as Vice-President.

Boston was selected as the next meeting place.

Southern Medical News

ALABAMA

The Birmingham Bacteriological Society was recently organized by laboratory workers and phys cians of Birmingham. Dr. A. H. Olive was elected President; Miss Blanche Frazier, Vice-President; Dr. James R. Bean, Secretary-Treasurer.

Dr. F. W. McCorkle, Huntsville, who has been Assistant County Health Officer for Madison County, has resigned his position and will go to Bainbridge, Ga., to become County Commissioner of Health. Dr. R. C. Stewart has succeeded Dr. McCorkle.

Dr. Andrew Louis Glaze announces his discharge from the Medical Corps of the Army and the opening

(Continued on page 38)

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(Continued from page 394)

of his office in the Empire Building, Birmingham. Practice limited to dermatology and syphilology.

Dr. Henry R. Carter, Jr., announces the opening of his offices in the Woodward Building, Birmingham. Practice limited to dermatology and syphilology.

Dr. Larcus R. Allen married Miss Mary Vaughn Shealy, both of Alexander City, April 5.

The State Tuberculosis Conference will be held in Birmingham, May 13 and 14, at the First Presbyterian Church.

Deaths

Dr. Robert C. Dickinson, Brundidge, aged 50, died early in March from heart disease.

Dr. Lee R. Burdeshaw, Headland, aged 44, died March 6 from cardiorenal disease.

Dr. Goldsby King, Selma, aged 63, died April 5 from acute dilatation of the heart.

Dr. James T. Searcy, Tuscaloosa, aged 80, died at the home of his daughter in Tuscaloosa, April 6.

Dr. Frederick W. McDonald, Wylam, aged 40, died in a hospital in Birmingham, April 6, from pneumonia.

Dr. Eben Bell Kirk, Montgomery, died March 10.

ARKANSAS

Dr. W. R. Bathurst, Little Rock, has purchased the Gans Building and will remodel and equip it for offices for professional men—doctors, dentists and lawyers.

At a meeting of the Conway County Medical Society, which met March 30 in Morrillton, the following officers were elected: Dr. B. C. Logan, Morrillton, President; Dr. A. L. Goatcher, Plumerville, Vice-President; Dr. H. E. Mobley, Morrillton, Secretary-Treasurer.

Erection of the new St. Edward's Infirmary, with a capacity of 200 or more beds, is one of the things promised for Fort Smith for 1920.

The new Moore & Wallas Sanitarium has been opened at Arkadelphia.

Dr. J. C. Davis, Harrisburg, has been appointed Health Officer of Poinsett County to succeed Dr. R. E. Yarbrough, deceased.

Dr. O. H. Tatum has been appointed City Health Officer of Arkadelphia to succeed Dr. W. T. Rowland, resigned.

At the meeting of the Arkansas State Board of Health held in Little Rock, March 25, the following officers were elected: Dr. Cyrus F. Crosby Heber Springs, President; Dr. F. O. Mahony, Eldorado, Vice-President; Dr. C. W. Garrison, Little Rock, re-elected Secretary and State Health Officer.

At the meeting of the Lee County Medical Society in Marianna, January 20, the following officers were elected: Dr. H. D. Bogart, President; Dr. C. W. Chaffin, Vice-President; Dr. M. McLendon, Secretary-Treasurer.

Officers elected for Pope County Medical Society are as follows: Dr. J. M. Stanford, Russellville, President; Dr. J. R. Linzy, Russellville, Secretary-Treasurer.

New officers for Nevada County Medical Society are: Dr. W. W. Rice, President; Dr. A. A. Reeder, Vice-President; Dr. O. G. Hirst, Secretary-Treasurer.

Deaths

Dr. J. B. Shaw, Sheridan, aged 72, died March 23.

Dr. Earl E. Craig, Wilson, aged 41, was killed by the overturning of his automobile in Wilson, March 30.

Dr. R. E. Yarbrough, Harrisburg, aged 36, died in the Paragould Sanitarium March 20 from septicemia following an infected wound of the finger.

Dr. A. C. Stanley, Tillar, aged 67, died in a hospital in Little Rock, March 24, from cerebral hemorrhage.

Dr. Richard B. Graves, Hot Springs, aged 77, died March 18 from pneumonia.

Dr. E. O. Brannon, Conway, aged 70, died March 11 from bright's disease.

Dr. S. M. Mosely, Huntington, aged 54, died March 29 from the effects of a gunshot wound of the abdomen, accidentally inflicted.

DISTRICT OF COLUMBIA

The U. S. Public Health Service has started a general investigation into the presence in some parts of the country of a disease resembling in its symptoms

(Continued on page 40)

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(Continued from page 38)

the typhus fever which is now ravaging large portions of Central Europe.

Dr. George Henry Bradford and Dr. Lydia Alden DeVilbiss, both of Washington, were married on March 30 in St. Louis.

Lieut. Albert G. Wensell, Medical Corps, U. S. Navy, Washington, married Miss Emma Pettit, of Harrisburg, Pa., on board U. S. S. "Mercy" at Brooklyn Navy Yard, April 8.

Deaths

Dr. James P. Saffold, Washington, aged 65, died February 29 from heart disease.

Dr. George W. Cabaniss, Washington, aged 62, died March 7 from acute gastritis.

FLORIDA

Reorganization of the Hillsborough County Tuberculosis Association was accomplished at a meeting held in Tampa on April 1. Officers elected were: Dr. D. F. Owen, President; Dr. T. F. Alexander, First Vice-President; Miss Kate Jackson, Second Vice-President; Mrs. C. C. Martin, Secretary.

Deaths

Dr. Benjamin L. Wills, Plant City, died early in March.

Dr. John R. Reeve, DeLand, died March 22.

GEORGIA

The Georgia State Medical Association held its annual meeting in Macon, May 5, 6, 7.

Dr. Frank W. McCorkle, former Assistant Health Officer of Madison County, Alabama, has been elected Commissioner of Health of Decatur County.

A Department of Sanitary Engineering has been established by the Georgia State Board of Health, with Mr. H. C. Woodfall as State Sanitary Engineer.

Dr. Warren Ashley Coleman and Miss Christine Edwards, both of Eastman, were married May 1.

Dr. Douglas Lamar Head, Concord, and Miss Adel Smith, Atlanta, were married March 25.

Deaths

Dr. Wm. O. Hitchcock, Dallas, aged 57, died March 31 from cerebral hemorrhage.

Dr. Logan D. Berry, Danville, aged 38, died February 29 from influenza.

Dr. W. E. Swinney, McRae, aged 73, died March 10 from nephritis.

Dr. Ora Haskell Lamb, Demorest, aged 73, died January 15 from pneumonia.

KENTUCKY

New officers for Mason County Medical Society are: Dr. A. R. Quigley, President; Dr. L. H. Long, Vice-President; Dr. P. G. Smoot, Secretary; Dr. J. H. Huchins, Delegate; Dr. J. T. Robb, Censor.

New officers for Harlan County Medical Society are: Dr. E. M. Howard, President; Dr. W. E. Riley, Vice-President; Dr. S. E. Crouch, re-elected Secretary-Treasurer.

Officers elected for Breckinridge County Medical Society are: Dr. J. S. Sandbach, President; Dr. R. W. Meador, Vice-President; Dr. J. E. Kincheloe, Secretary-Treasurer.

Officers elected for Letcher County Medical Society are: Dr. John D. Fitzpatrick, President; Dr. J. W. Moss, Vice-President; Dr. Bert C. Bach, Secretary-Treasurer.

Officers elected for Cumberland County Medical Society are: Dr. J. E. Bow, President; Dr. J. H. Meyers, Vice-President; Dr. W. C. Kun, Secretary-Treasurer.

New officers for Montgomery County Medical Society elected as follows: Dr. D. H. Bush, President; Dr. O. P. Henry, Vice-President; Dr. J. F. Jones, Secretary.

Officers elected for Crittenden County Medical Society are: Dr. T. A. Frazer, President; Dr. O. T. Lewary, Vice-President; Dr. C. G. Moreland, Secretary and Treasurer.

Officers elected for Metcalfe County Medical Society are: Dr. James Taylor, President; Dr. H. R. Vanzant, Secretary-Treasurer.

(Continued on page 42)

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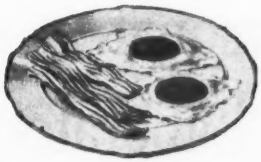

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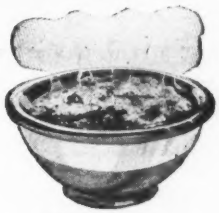

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(Continued from page 40)

Officers for Nelson County Medical Society are: Dr. S. A. Cox, President; Dr. J. J. Wakefield, Vice-President; Dr. H. D. Rodman, Secretary-Treasurer.

Dr. C. Morris Caldwell, Louisville, has been elected all-time Health Officer for Scott County.

According to an announcement by Dr. A. T. McCormack, Secretary State Board of Health, fifteen cases of sleeping sickness have developed in Louisville.

At a recent meeting of the physicians and surgeons of Paris a reorganization of the old Bourbon County Medical Society was effected. The following officers were elected: Dr. Wm. Kenney, President; Dr. H. B. Anderson, Shawham, First Vice-President; Dr. G. C. Cook, North Middletown, Secretary-Treasurer.

Dr. Oliver H. Parrigan, Monticello, married Miss Mai Akers, Sonora, April 7.

LOUISIANA

Mrs. Carrie Hardwick was re-elected President of the Shreveport Graduate Nurses' Association at the annual meeting held March 31. Other officers as follows: Sister Mary Celestine, Vice-President; Miss Ida Bloxom, Vice-President; Miss Louise Ghelen, Secretary-Treasurer.

A new hospital is to be erected in DeRidder, and is to cost $50,000.

In New Orleans a $1,000,000 hospital is to be erected by the Southern Baptists.

Dr. B. F. Gallant, Medical Director Belvedere Private Sanitarium, announces the removal of his city offices to Audubon Building. Practice limited to mental and nervous diseases.

Deaths

Dr. George P. Minvielle, Jeanerette, aged 64, died in St. Mary's Hospital, Patterson, March 14.

Dr. Jean B. C. Gazzo, Raceland, aged 63, died March 14 from heart disease.

MARYLAND

The Maryland State College of Agriculture and the University of Maryland School of Medicine have been combined under the name of University of Maryland. The new institution possesses a college of arts and sciences, a military school and schools of medicine, dentistry and pharmacy. The Legislature appropriated $42,500 each year for the medical school for the next two years, and also appropriated $185,476 for the other departments of the university for 1921, and $165,416 for 1922. Another appropriation of $203,000 was made for buildings and equipment.

Dr. Howard Davis Lewis, Baltimore, married Mrs. Flora M. Gottschall, of Sunbury, Pa., March 25.

Dr. Thomas S. Cullen, Baltimore, married Miss Mary Bartlett Dixon, Baltimore, at Princeton, April 6.

Deaths

Dr. Charles Lowndes, Easton, aged 87, died February 24 from arterio-sclerosis.

Dr. John D. Blake, Baltimore, aged 66, died March 30 from heart disease.

Dr. Royal Lee Hobbs, Reisterstown, aged 25, died March 29.

Dr. George S. Dare, Rising Sun, aged 77, died March 24.

Dr. J. Carl Smith, Ellerslie, aged 59, died in Franklin Square Hospital, Baltimore, February 28 from cerebral hemorrhage.

MISSISSIPPI

It has been reported that smallpox is prevalent in half of the counties of the State. During the last fourteen days of March 783 cases were reported from forty-one counties.

Dr. W. S. Stone, U. S. Public Health Service, recently went to Vicksburg to conduct the work of establishing a clinic for social disease. He stated that $8,000 would be required for this clinic, of which amount $5,000 has been contributed by the government, the State and neighboring counties. Warren County will be asked to contribute $3,000.

At a recent meeting of the North Mississippi Six County Medical Society, composed of Tippah, Benton, Union, Marshall, Yalobusha and Lafayette Counties, Dr. Ira B. Seale, Holly Springs, was elected President; Dr. G. W. Sisler, Water Valley, Vice-President; Dr. B. S. Guyton, Oxford, Secretary.

Dr. Charles Allen McWilliams married Miss Nona Harry, both of Gulfport, on April 8.

(Continued on page 44)

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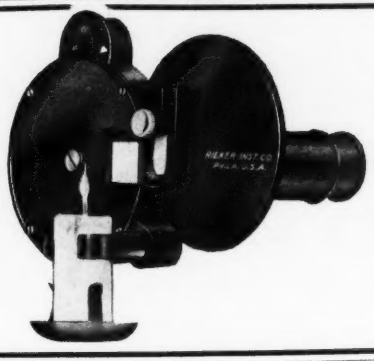

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NEW YORK

(Continued from page 42)

Deaths

Dr. G. W. Wilson, Vaiden, aged 60, died March 23.

MISSOURI

At the meeting of the Missouri State Medical Association held in Jefferson City, April 6-8, the following officers were elected: Dr. W. F. Ferguson, Sedalia, President; Drs. R. L. Neff, Joplin, T. J. Rigdon, Kennett, Thomas Chowning, Hannibal, W. C. Taylor, St. Louis, and J. I. Chambers, Kansas City, Vice-Presidents; Dr. J. F. Welch, Salisbury, Treasurer; Dr. E. C. Goodwin, St. Louis, Secretary. St. Joseph was selected as the meeting place for 1921.

New officers elected for Howard County Medical Society are as follows: Dr. Elbert King, New Franklin, President; Dr. W. E. Williams, Fayette, and Dr. Walter M. Dickerson, Armstrong, Vice-Presidents; Dr. Charles W. Watts, Fayette, Secretary-Treasurer.

Dr. R. A. Woolsey, St. Louis, has succeeded Dr. George W. Cale, Jr., resigned, as chief surgeon of the St. Louis & San Francisco Railroad.

Deaths

Dr. C. E. Walters, Dexter, aged 41, died March 26.

Dr. J. R. Champion, Hilldale, aged 51, died March 8.

Dr. J. R. Hereford, Jr., aged 58, died March 27 from cerebral hemorrhage.

Dr. Harry A. Upshaw, St. Louis, aged 42, died in St. Anthony's Hospital, April 3.

Dr. Herbert S. Hill, Springfield, aged 76, died in a hospital in Springfield, April 1.

Dr. R. C. Wichterich, Cape Girardeau, aged 52, died in his office April 2.

Dr. Martin T. Baisley, Joplin, aged 66, died early in March from valvular heart disease.

Dr. R. H. Disse, St. Louis, aged 51, died March 8 from cardiorenal disease.

Dr. Charles Lee Holloway, St. Joseph, aged 53, died March 5 from broncho-pneumonia.

Dr. F. T. Reyling, Kansas City, aged 59, died February 24 from pneumonia.

Dr. R. A. Phelan, St. Louis, aged 47, died March 14 from malignant disease.

NORTH CAROLINA

A campaign is on foot to raise $50,000 for a new building for the Mission Hospital at Asheville.

Deaths

Dr. Allen R. Holshouser, Rockwell, aged 66, died February 26 from injuries caused by a locomotive striking the automobile in which he was riding on February 24.

OKLAHOMA

The Legislature has appropriated $20,000 as a preliminary to take over the Rolater Hospital in Oklahoma City. The plant will be devoted to treatment of disabled soldiers and sailors under the operation of the War Mothers, an organization of Oklahoma City.

Dr. P. P. Nesbitt and Mrs. Gertrude Morton, both of Muskogee, were married in Tulsa, March 22.

Dr. F. A. White and Mrs. F. F. Brown, both of Wapanucka, were married in Durant, February 27.

Dr. Wm. A. Dean, Tulsa, and Miss Fannie Belle Hamilton, Seneca, S. C., were married at Tulsa, April 3.

The Employees Hospital Association, Miami Mineral Belt Railroad Co., Dr. J. Clay Williams, Chief Surgeon, are building and equipping a modern emergency hospital at Slick, Okla.

Deaths

Dr. R. S. Willard, Ardmore, aged 54, died at Lakeland, Fla., March 1 from influenza.

Dr. W. M. Johnson, Peckham, aged 65, died in Oklahoma City, February 13, after a surgical operation.

Dr. B. E. Braselton, Miami, aged 43, died February 9 from pneumonia.

SOUTH CAROLINA

The South Carolina State Medical Association held its seventy-second annual meeting in Greenville, April

(Continued on page 46)

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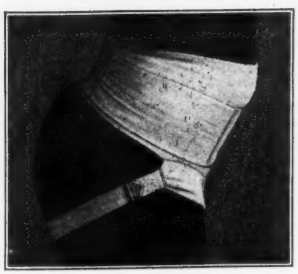

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Dr. Geo. B. Adams, Director

(Continued from page 44)

20-21. The following officers were elected. Dr. W. P. Timmerman, Batesburg, President; Dr. Miles J. Walker, York, Dr. William A. Boyd, Columbia, and Dr. William W. Fennell, Rock Hill, Vice-Presidents; Dr. E. A. Hines, Seneca, Secretary-Treasurer; Dr. A. E. Baker, Charleston, Dr. Samuel E. Harmon, Columbia, Dr. Thomas L. W. Bailey, Clinton, Dr. Leland O. Mauldin, Greenville, Dr. T. N. Duten York, Dr. Charles R. May, Bennettsville, Dr. Harry L. Shaw, Sumter, and Dr. Leighton A. Hartsog, Olar, Councilors.

The latest drive to be launched in Charleston is the "Kill-the-Rat" campaign. Literature concerning the rat and the damage wrought by them and the methods of extermination is available for distribution by the health department. Every one in the city has been asked to take part in the "Kill-the-Rat" campaign.

Dr. R. G. Hamilton, Rockton, has been elected head of the Public Health Service of Fairfield County, headquarters at Winnsboro.

The Medical College of the State of South Carolina has secured an appropriation of $71,000 from the State for maintenance. An additional appropriation of $60,000 was made for a physiology building and equipment.

Dr. T. B. Brown, Charleston, has taken charge of the Anderson Clinic, to succeed Dr. L. W. Blake, resigned.

Dr. B. L. Chipley announces the opening of his offices in Greenville. Practice limited to urology.

Deaths

Dr. Wm. W. Ray, Eastover, aged 61, died in the Columbia Hospital, Columbia, March 1 from angina pectoris.

Dr. B. F. Walker, Colerain, aged 87, died April 7.

Dr. J. K. Gilder, Newberry, aged 64, died in the Columbia Hospital, April 6.

Dr. W. K. Sharp, Pendleton, aged 74, died March 18.

Dr. Thomas R. Carothers, Rock Hill, aged 65, died March 31 from heart disease.

Dr. Lane Mullally, Charleston, aged 53, died March 25.

TENNESSEE

At the meeting of the Tennessee State Medical Association held in Chattanooga, April 6-8, the following officers were elected: Dr. Leon L. Sheddan, Knoxville, President; Dr. George R. West, Chattanooga, Dr. Powell K. Lewis, Doyle, Dr. John J. Shea, Memphis, Vice-Presidents; Dr. Olin West, Nashville, Secretary; Dr. Joseph F. H. Gallagher, Nashville, Treasurer. Next meeting will be held in Nashville.

Memphis has subscribed a total of $712,277 for the Baptist Memorial Hospital. By Memphis raising more than $500,000, pledges of $650,000 from the Tri-States Baptist Association will be available, which will make a total of $1,362,277. The largest single subscription was for $200,000, made by Will Dockery as a memorial to his wife, who died a few months ago. He also recently gave a plantation valued at about $400,000.

(Continued on page 48)

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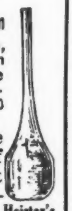

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(Continued from page 46)

New officers for Washington County Medical Society are: Dr. James G. Moss, President; Dr. Lee K. Gibson, Vice-President, both of Johnson City.

New officers for Jackson County Medical Society are: Dr. J. D. Quarles, Whitlyville, President; Dr. R. C. Gaw, Gainesboro, Secretary.

New officers for Lincoln County Medical Society are: Dr. James M. Shelton, Kelso, President; Dr. J. M. McWilliams, Fayetteville, Secretary.

New officers for Giles County Medical Society are: Dr. G. D. Butler, Pulaski, President; Dr. Wm. H. Cole, Minor Hill, Vice-President; Dr. C. A. Abernathy, Pulaski, Secretary; Dr. G. C. Grimes, Pulaski, Treasurer.

The Methodists started a drive April 18 to raise $400,000 to complete their hospital. It is planned to raise in West Tennessee, Mississippi and Arkansas $350,000 for the same work.

Work on the new Goetz Sanitarium at Fountain City has been started. It is estimated that the work will be completed by June 15. The structure is being erected to replace the sanitarium of Dr. H. E. Goetz, which was recently destroyed by fire. The cost of the new building will be $25,000.

Dr. J. J. Neely, Memphis, has been appointed registrar of vital statistics in Shelby County to succeed O. L. Slater.

Dr. Cummings Harris, Memphis, has been appointed Secretary of the Memphis Health Department, to succeed Dr. Newman Taylor.

The annual examination of the State Board of Medical Examiners will be held June 11-12 in the cities of Memphis, Nashville and Knoxville.

Deaths

Dr. J. H. Giles, Big Sandy, aged 55, died March 18 from double pneumonia following influenza.

Dr. Charles S. Briggs, Nashville, aged 69, died in the Briggs Infirmary, Nashville, March 23, from influenza.

Dr. Edward Y. Napier, Waverly, aged 76, died March 10.

Dr. H. E. Bickford, Memphis, aged 35, died March 31 from ether pneumonia following an operation from gallstones.

Dr. A. B. Bradford, Belleview, aged 67, died April 4 from pneumonia.

Dr. B. N. Dunavant, Memphis, aged 37, died April 11.

Dr. I. L. Lofton, Nashville, aged 79, died March 20 from cerebral hemorrhage.

Dr. Robert Lee Taylor, Cleveland, aged 50, died in his office April 7.

TEXAS

The South Texas District Medical Association met at Beaumont, March 25-26. Victoria was chosen as the place for the fall meeting.

Dr. Ike Withers, Fort Worth, has been appointed City Physician to succeed Dr. Webb Walker, resigned.

Dr. W. H. Minton, Houston, has been appointed Assistant State Health Officer, to succeed Dr. Douglas Largen, resigned.

Officers elected for the State Board of Medical Examiners are as follows: Dr. D. S. Harris, Dallas, President; Dr. R. Y. Lacy, Pittsburg, Vice-President; Dr. T. J. Crowe, Dallas, Secretary-Treasurer. Next meeting of the board will be held at Galveston, June 21-23.

At the recent meeting of the Brazos County Medical Society, held in Bryan, the following officers were elected: Dr. W. B. Cline, President; Dr. C. A. Searcy, Vice-President; Dr. L. O. Wilkerson, Secretary-Treasurer, all of Bryan.

The semi-annual meeting of the Texas Surgical Society, which has a membership of 100, met in San Antonio, April 5-6.

Twenty-five surgeons, among whom were representatives from every Congressional district in the State, met in San Antonio, March 18, and formed an organization to be known as the Clinical Surgeons of Texas. The new organization is a branch of the Clinical Congress of the American College of Surgeons, and will meet annually in the different larger cities of the State, when clinics will be held and papers will be read by experts in different lines of surgery. Dr. Bacon Saunders, Fort Worth, was elected President. Other officers as follows: Dr. W. B. Thorning, Houston, Secretary; Dr. W. B. Russ, San Antonio, Councilor.

(Continued on page 50)

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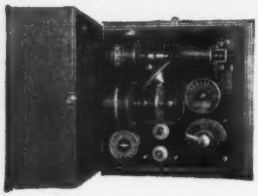

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(Continued from page 48)

Deaths

Dr. R. R. Weir, aged 62, died recently.

Dr. T. K. Proctor, Sulphur Springs, died recently from carcinoma.

Dr. G. S. Carter, Beckville, aged 58, died at the home of his daughter in Marshall, March 4, from tuberculosis.

Dr. R. L. Long, Atlanta, aged 46, was killed in a grade crossing accident March 23.

Dr. R. S. Johnston, Orange, aged 57, died in San Antonio early in March.

VIRGINIA

In March Albemarle County launched a year's intensive health campaign under the direction of Dr. W. S. Keister, of the State Booard of Health.

The State Board of Health has appointed as the physician members for the Board of Health for Stafford County, Dr. J. C. Gordon, Garrisonville; Dr. H. W. Patton, Hemp, and Dr. L. F. Lee, River Road. These, together with the chairman and clerk of the Board of Supervisors, will constitute the County Board of Health.

Dr. Samuel Newman has been appointed Assistant Health Officer of Danville, to succeed Dr. C. C. Merriam, resigned.

The Watt Hairston Memorial Hospital, which was a gift to Martinsville, and opened about four months

(Continued on page 52)

CLASSIFIED ADVERTISEMENTS

WANTED—Field Director Rural Sanitation in Southern State. Salary, $2,700 to $3,600 with $800.00 expense allowance. Address C. C., care JOURNAL.

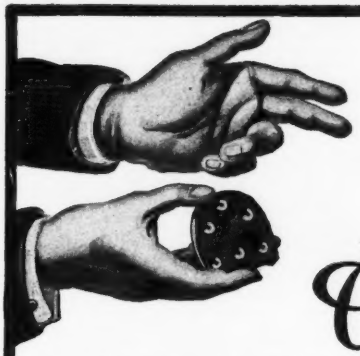
APPLICATIONS are desired from physicians for desirable positions with a large corporation. Please state your age and college and the year graduated. Furnish small, inexpensive photograph if convenient. Applications will be considered strictly confidential. C. F. U., care JOURNAL.

FOR SALE—Small sanitarium, near Baltimore, Md., which has been successfully operated for 13 years. Endorsed and patronized by leading physicians of the city. Twelve acres, brick building, on R. R. Owner wishes to retire. Address S. G. L., care JOURNAL.

WANTED—Electric Light Bath Cabinet complete. Give size, make, age, condition and lowest price f. o. b. location. Also one photomicographic camera, make, condition and lowest price. Address P. S., care JOURNAL.

WANTED—Location as radiographer. Will act as assistant, partner or will buy a good location. Have had three years' experience in radiography and treatment work. Served as radiographer in large Army base hospital in late war. Will gladly furnish references as to character and ability. Address H. L. J., care JOURNAL.

INTERNES WANTED—St. Joseph's Hospital (a three-hundred bed general hospital) needs two more internes, and would be glad to consider applications. Recent graduates preferred; state school graduated from and year of graduation. Compensation, board and lodging, and instruction. Term of service, one year. Apply to Dr. O. S. McCown, Bank of Commerce & Trust Building, Memphis, Tenn., President of Staff.



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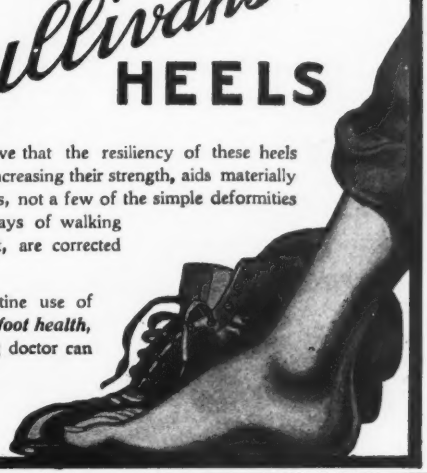

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(Continued from page 50)

ago, was totally destroyed by fire March 6. The loss is estimated at $25,000.

The Legislature has appropriated $30,000 to the State Board of Health for the purpose of building an orthopedic hospital for the treatment of crippled and deformed children.

Plans for the U. S. Public Health Service Hospital, Roanoke, have been completed and construction of the new hospital near the Army Supply Base is expected to begin soon. An appropriation of $900,000 was made by Congress last year for this work. The hospital will be a three-story structure of brick and stone with a capacity of 300 beds.

Formal opening of the new $210,000 hospital for negroes—and yet unnamed—has been set for June 1, according to an announcement by Superintendent Fred B. Morlok, of Memorial Hospital.

Dr. T. A. Williams, Middletown, married Miss Marie Pittman, Charles Town, in Washington, D. C., February 11.

Dr. Alexander F. Robertson, Staunton, married Miss Frances Sexton, Hazelhurst, Miss., March 26.

Dr. J. N. Elder, Hopewell, married Miss Myrle Fagg, Christiansburg, March 9.

Dr. Daniel D. Talley married Miss Anne Hays Myers, both of Richmond, April 29.

Deaths

Dr. Joseph J. Shanks, Salem, aged 63, died at McAlpin, W. Va., March 31 from pneumonia.

Dr. Donald McPhail, Southside, aged 65, died at a Richmond hospital March 11 after a long illness.

Dr. R. C. Bayly, Alexandria, aged 38, died in the Episcopal Eye, Ear, Nose and Throat Hospital, Washington, D. C., March 28, three days after an operation for mastoiditis.

Dr. Zenas Fearing Walker, Norfolk, aged 46, died March 25 from heart trouble.

WEST VIRGINIA

Dr. Harriet B. Jones has been made Field Secretary of the State Tuberculosis League and will devote her whole time to the work throughout the State.

Dr. Robert W. Fisher married Mrs. Emily white Mills, both of Morgantown, February 13.

Deaths

Dr. Louis F. Keever, Parkersburg, aged 61, died February 16 from pernicious anemia.

Dr. Thomas A. Harris, Parkersburg, aged 89, died February 29.

Dr. C. H. Ice, Mannington, aged 65, died March 21 from heart disease.

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IRON AND ARSENIC	5cc Iron Cacodylate, 64 mg. (1 grain).	The most positive and prompt method of raising blood count and hemoglobin contents. Anemias, Malaria, Pellagra, Psoriasis, Neurasthenia, Syphilis, Skin Diseases, Tuberculosis, Chlorosis, Pericarditis.
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SODIUM IODIDE	20cc Sodium Iodide U. S. P. 2 gms. (31 grains).	Asthma, Chronic Arthritis, Syphilis, Nephritis, Tuberculosis, Glandular involvements, Pneumonia.
SALICYLATE AND IODIDE	20cc Sodium Salicylate U.S.P. 1 gm. (15 grains); Sodium Iodide U. S.P., 1 gm. (15 grains).	Grippe, Influenza, Acute and sub-acute Streptococci infections.
SODIUM SALICYLATE	5cc Sodium Salicylate U.S.P. 1 gm. (15 grains).	Tonsilitis, all Streptococci infections, acute Arthritis, etc.
MERCURY BICHLORIDE	5cc Mercury Bichloride, 16 mgs. (1/4 grain).	Syphilis, Erysipelas, Influenza, Gonorrheal Rheumatism.
MERCURY OXYCYANIDE	5cc Mercury Oxycyanide, 8 mgs. (1/4 grain).	Syphilis, etc.
QUININE DIHYDROCHLORIDE	5cc Quinine Dihydrochloride U.S.P. 5 gms. (7 1/2 grains).	Malaria, etc.
HEXAMETHYLENAMINE	5cc Hexymethyl. U.S.P. Urotropin Formin, 1.5 gm. (24 grains).	Pyelitis, Cystitis, Colon infections, Toxemias of Tuberculosis, Pelvic infections, Pneumonia, Meningitis, etc.

TECHNIC: Do not dilute this solution. Break ampoule, draw into all-glass syringe and attach a 23 to 25 gauge needle. Use tourniquet or have patient grasp the arm with his free hand until the veins at the bend of the elbow stand out prominently; run the needle into the vein quickly. Blood usually comes back into syringe back of needle or can be drawn back to be certain that needle is in the vein; release pressure, then inject slowly.

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4—Testing of Therapeutic Agents

THIS house received a ton of ergot a few months ago. Samples of it were subjected to a series of physiological tests. The drug was only one-half as active as that demanded by our standard. The shipment was promptly rejected.

During the past three years difficulty was experienced in getting digitalin of a quality that would meet our requirements. Numerous samples were tested. They ranged in activity all the way from 25% to 75% of our specifications. The result is that no digitalin is supplied under the P. D. & Co. label at the present time.

Consignments of digitalis leaves received during the past few years showed a pronounced variation in activity when tested physiologically. One lot was three times as potent as the standard. Two others were respectively one-fourth and one-half as potent.

Recently a quantity of belladonna leaves was examined that assayed two-thirds of the desired strength. Another lot was twice as potent as the recognized standard. Several lots of aconite showed as much variation in activity as 400%, and hyoscyamus, on different occasions, varied as much as 500%.

Standard preparations of variable drugs, such as those mentioned, are made by increasing or decreasing the amount of raw material used in the manufacturing process.

Some time ago it was impossible to get strophanthus of good quality. The commercially available drug, when tested physiologically, proved to be only one-fourth as potent as the standard requirement. As a result, it was necessary to use four times the usual quantity of drug to make a product that would conform to the specifications of this house.

Methods of testing therapeutic agents are being devised and improved constantly in our scientific laboratory. Frequently there are no charted paths to follow—no established methods of determining the potency of drug products. In such cases we proceed to devise standards. A biological product for the control of hemorrhage was developed recently. How could the activity of the preparation be determined? And how could the product be adjusted to a uniform standard of activity? A physiological test was devised—a test which specifies that this hemostatic must shorten the coagulation time of the blood to at least one-third the normal for the test animal used.

Thousands of raw products are used by this house in manufacturing its three thousand pharmaceutical and biological preparations. Every substance which enters into a medicinal product is tested before it is accepted; and every finished preparation is likewise tested by the best available scientific method to insure a definite and uniform standard of activity.

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